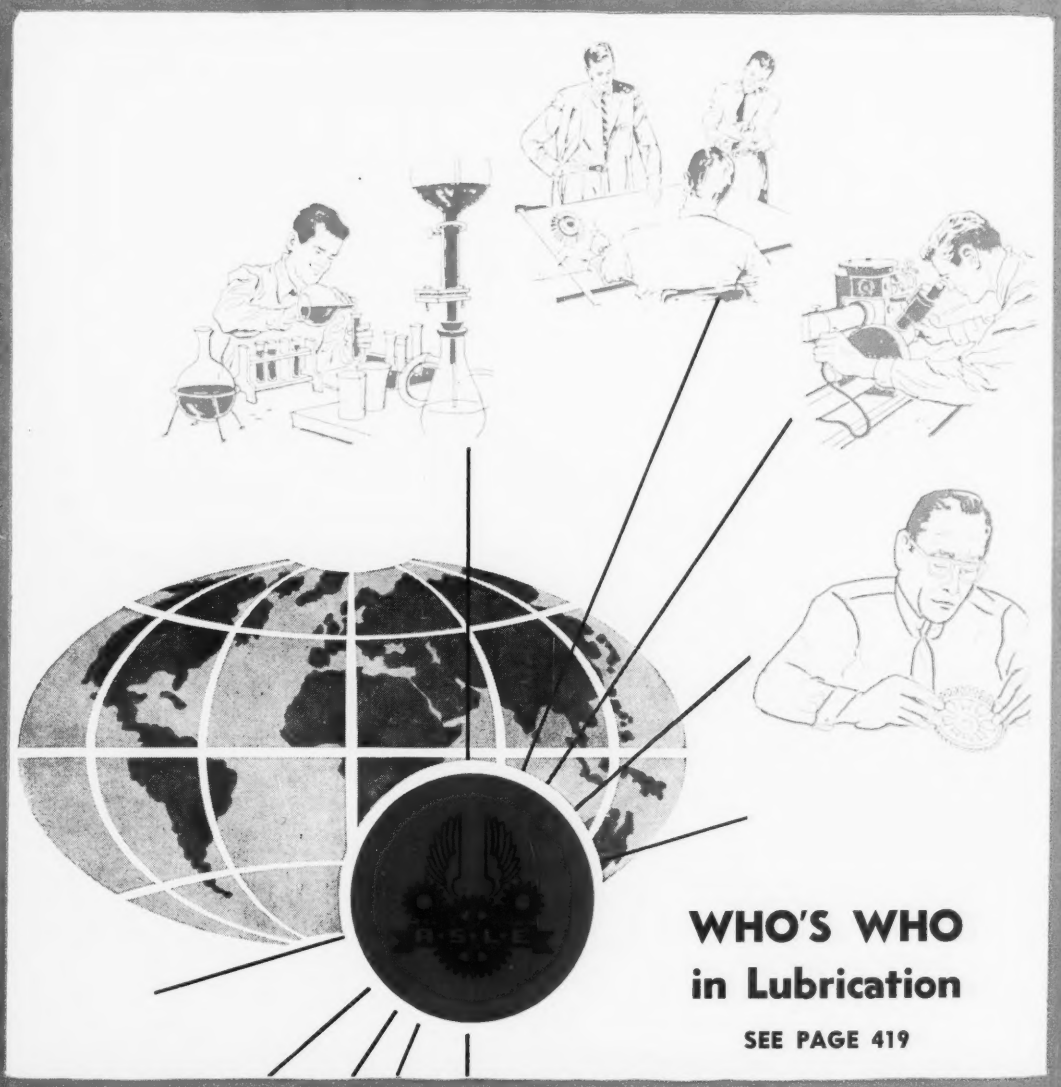
Vol 17, No. 9 September, 1961

LUBRICATION ENGINEERING

DESIGN RESEARCH APPLICATION EDUCATION MAINTENANCE



WHO'S WHO in Lubrication

SEE PAGE 419

JOURNAL OF THE AMERICAN SOCIETY OF LUBRICATION ENGINEERS

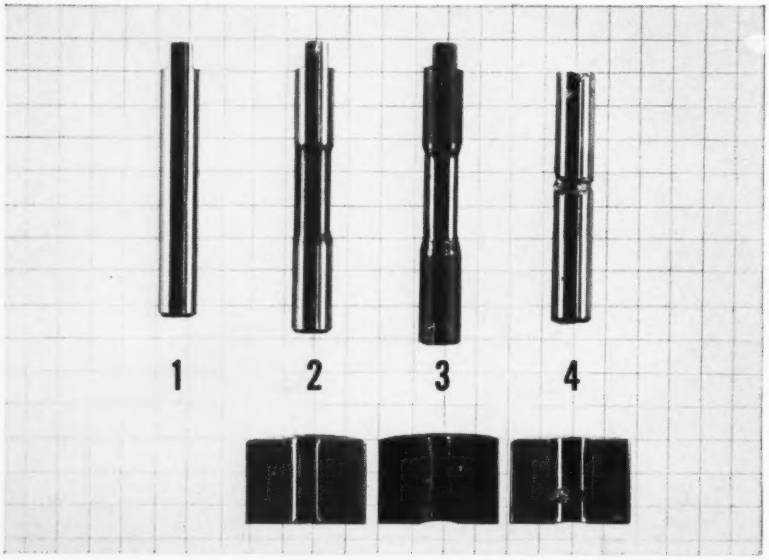
CLIMAX MOLYBDENUM

Molysulfide® News Digest

CLIMAX MOLYBDENUM COMPANY, a division of American Metal Climax, Inc., 1270 Avenue of the Americas, New York 20, N.Y.

RECENT TEST SHOWS MORE PROOF OF MoS_2's LOAD-CARRYING ABILITY

From the German laboratory of Alpha Molykote Corporation comes new proof of Molysulfide's ability to resist galling and seizing at pressures beyond the yield point of most metals. Previous tests have shown that Molysulfide provides positive protection up to 475,000 psi. In this Alman Wieland test, similar to the Falex test, a ¼-inch pin actually extruded *without any surface damage* at pressures of 100,000 psi, while those using other lubricants were torn, galled or "frozen" to the point of breakage.



Photograph above shows mild steel test pins. No. 1: unused pin. No. 2 (lubricated .with mineral oil and Molysulfide) and No. 3 (with Molysulfide bonded coating) were subjected to rotating pressures between bearing halves. Both were elongated and extruded without galling, seizing, or weight loss. No. 4 shows typical failure with conventional lubricant. Note that the key sheared off and pin and block were galled and seized.

Extensive surveys among a great many independent laboratories indicate that the extrusion phenomenon produced with Molysulfide has never been achieved with any other conventional lubricant.

This proven load carrying ability of Molysulfide is only one of the reasons why grease compounders and lubrication engineers are investigating and testing new uses for MoS_2.

Other reasons include its extremely low coefficient of friction; its wide temperature range from −300 F to 750 F; its tenacious adherence to metal surfaces and a resultant great resistance to "scrape-off" and "wash-off"; and, its high chemical stability combined with long-life characteristics.

The uses for solid lubricants are multiplying. And—by test—Molysulfide is the superior solid lubricant.

When writing, refer to CL-111

Grease Compounders Take Hard Look At Paste Type Concentrates

In a recent issue of NLGI SPOKESMAN, a prominent lubrication authority warns that in the future an increasing number of the newer machines will be greased "for life"—or for long lubrication intervals. He also says that as the industrial pace quickens and wages go up, it will be more economical to use more expensive grease and reduce lubrication frequency.

That's why grease compounders and blenders are looking into every possible way to maintain and increase their profit levels.

High on investigation priority lists are the paste type concentrates. These concentrates contain solid lubricants. Molysulfide concentrates can be applied by grease guns or by brushing, and will stand up at temperatures as low as −100 F. and peaks as high as +500 F.

Concentrate users include a fast spreading number of industries. Major manufacturers in the automotive industry use paste type Molysulfide concentrates for pre-assembly lubrication of splines, cams, etc.

The aviation and missile industry is using an increasing amount to overcome low-temperature problems in servo-mechanisms, bearings and gears.

General industry is applying them, not only on metals exposed to continuous high temperatures, but also on plastic bearings, machine tool ways, press fittings and other moving parts where long lubricant life and high load carrying capacity is needed.

Much remains to be learned about the full potentialities of paste type concentrates but all signs indicate they are one of the answers to lubrication problems of the future.

When writing, refer to CL-110

Volume 17, No. 9
September, 1961

Lubrication Engineering

DESIGN RESEARCH APPLICATION EDUCATION MAINTENANCE

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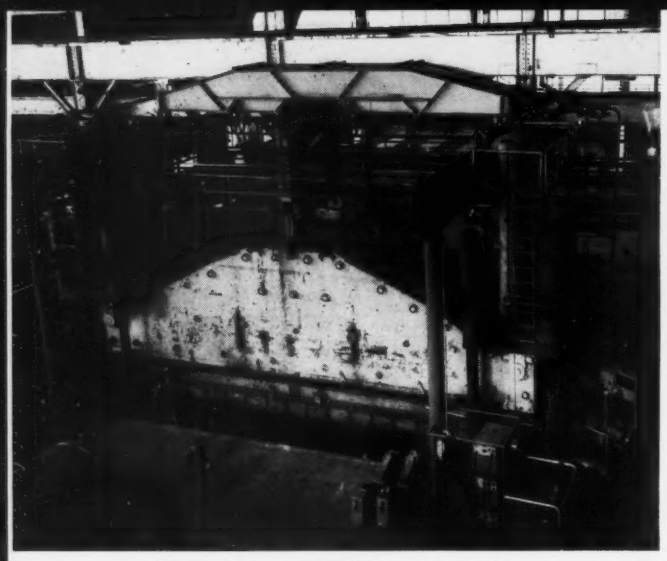
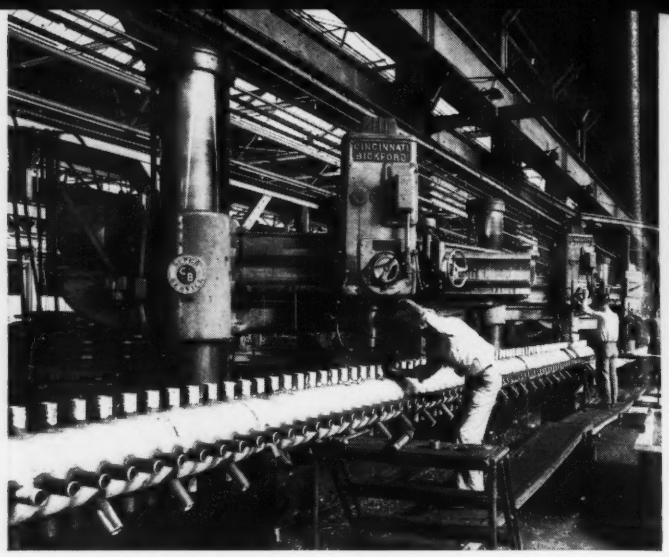
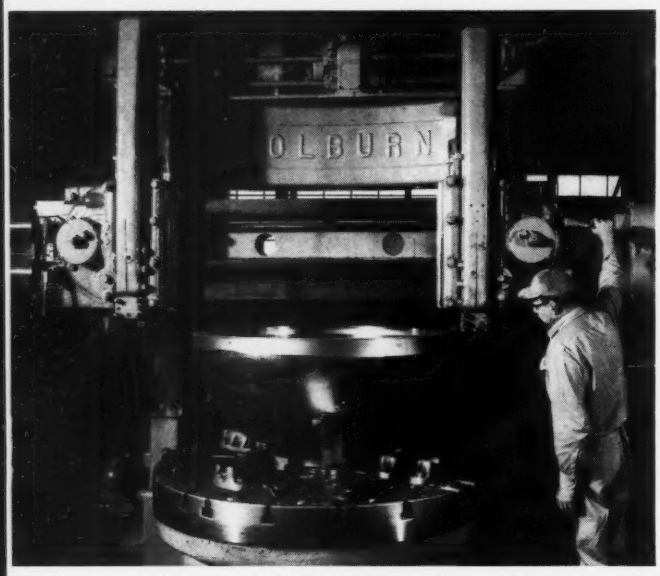


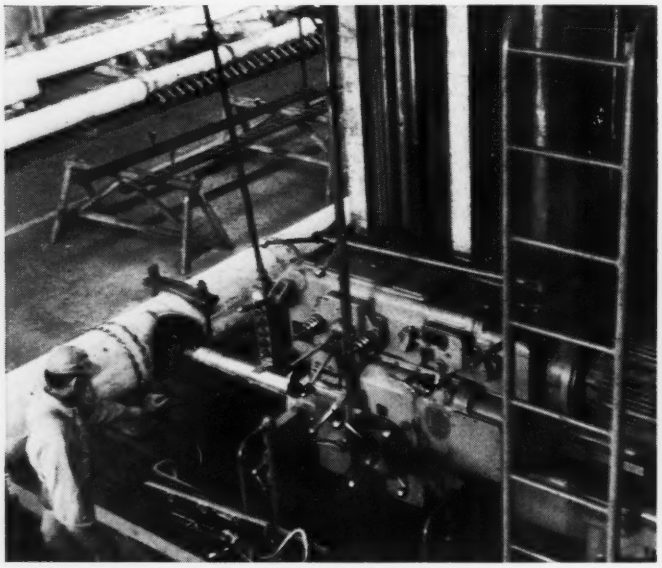
Overhead view of 2500-ton press. It forms heavy steel plate for drum shells—up to 7 inches thick, up to 30 feet long. Gulf Harmony 61 is used in the hydraulic system.



Cincinnati Bickford radial drill presses — working on headers. Gulf Harmony 61 is used in column mechanism, drill-head mechanism and main drive gear boxes. Gulf Precision Grease is applied to fittings.



Colburn Vertical Boring Mill—milling a drum head. Gulf Harmony 61 is used in the circulating system for main drive gears; in the reservoir for feed change gears.



Giddings & Lewis 6" horizontal boring machine—boring hole in header. Gulf Harmony lubricates the column slides and screws on this new machine.

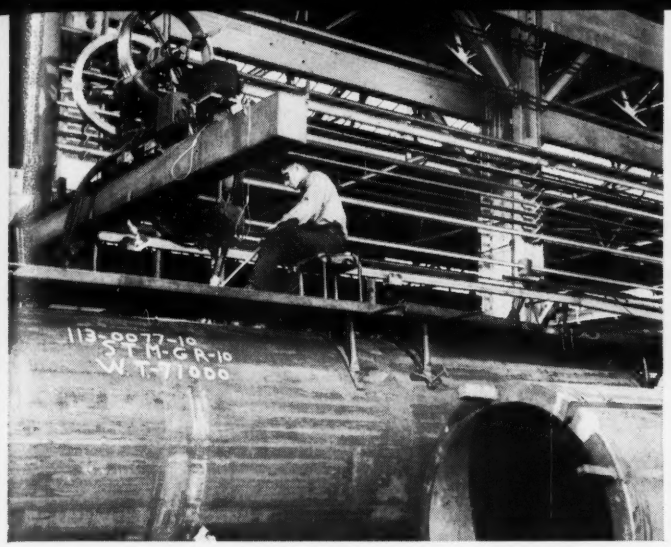
Simplified lube program helps Babcock 16 lubricants to just 7...

The Paris, Texas, plant of Babcock & Wilcox specializes in the manufacture of steam generating equipment. Typical examples: 65-ton boiler drums and 4-ton tube sections.

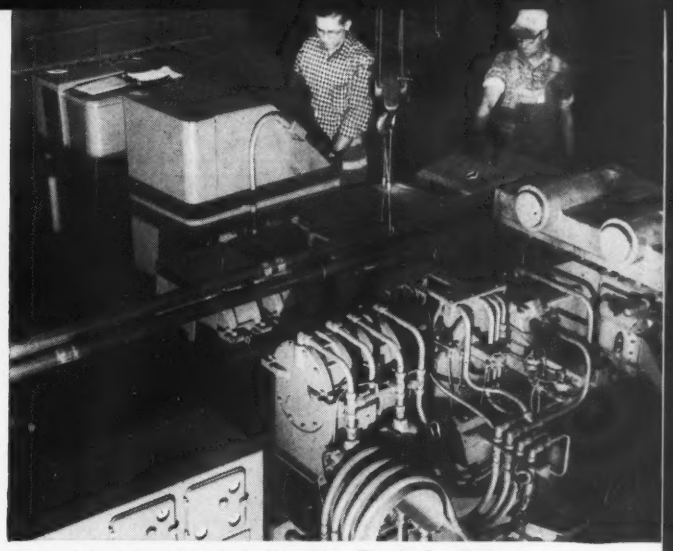
Recently, Gulf Sales Engineers conducted a lubricant survey in this plant. As a result, lubes were reduced from 16 to 7. This reduced the possibility of application errors and simplified ordering, bookkeeping and handling.

"It's important to keep lube recommendations up to date," says C. C. Eagon, Master Mechanic. "We call in lubrication engineers as new machines arrive. And they help us translate the manufacturer's lube recommendations in terms of their oils and greases."

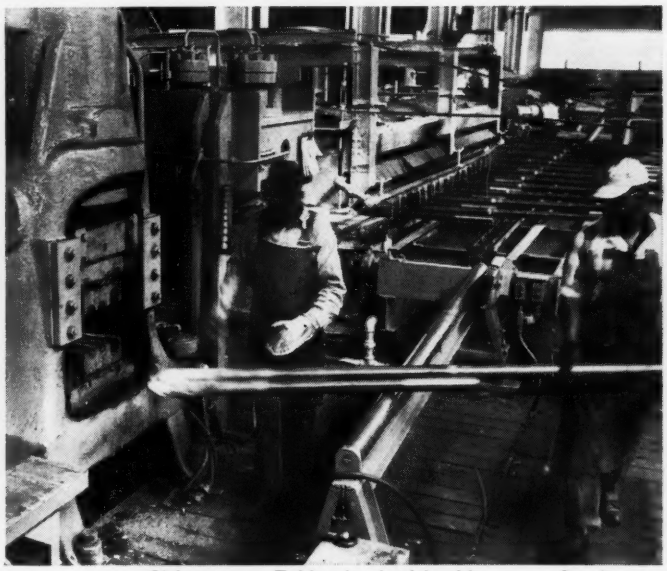
The seven recommended grades are really four basic types of Gulf oils and greases. First, Gulf Harmony® oils—highly stable lubricating oils with excellent water separating properties; inhibited against



Automatic submerged arc welder is used to weld drum halves together, Gulf Precision Grease and Gulf E.P. Lubricant 95 protect bearings and gears of this machine against excessive wear.



Tubes joined together in butt-welder. The hydraulic system reservoir is filled with Gulf Harmony 44. Gulf Harmony 61 is used in milling machine gear box. Gulf Precision Grease lubricates guide shaft bearings.



Sizing press. Tubing is sized in this press after it goes through swedging, upsetting and bending operations. Ways and shaft bearings are lubricated with Gulf Precision Grease, from central greasing system.

Works Manager R. L. Reed (left) talks with Frank P. Mauro, Gulf Sales Engineer. The drums behind them are being shipped to a new power plant in Santos, Brazil.

& Wilcox reduce
GULF MAKES THINGS RUN BETTER!

rust and corrosion. Next, Gulf E.P. Lubricants—used where shock loads and high pressures are factors. These superb lubricants are non-foaming, noncorrosive and extremely stable. Thirdly, Gulf Lubcote®—tough and tenacious. It protects against wear. And it cushions the sliding and rolling of gear teeth. Lastly, Gulf Precision Grease—a general purpose ball and roller bearing grease to satisfy the plant's grease-lubrication demands.

Simplify your lube inventory with versatile Gulf multipurpose lubricants. And see for yourself how Gulf makes things run better! Just call a Gulf Sales Engineer at your nearest Gulf office. Or write for information.

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Dept. DM, Gulf Building
Houston 2, Texas

GULF

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SAFE-LEVEL SIGHT FEED

That's right! The finest lubricator on the market today has been refined to give you even *more* for your money. Now, the McCord Model 55 Lubricator comes equipped with new, exclusive Safe-Level Sight Feed with these outstanding benefits for you . . . safe, sure warning of malfunction . . . quicker priming . . . better feed regulation . . . extreme accuracy . . . improved reliability. IMPORTANT: Safe-Level Sight Feed can also be added to existing Model 55 Lubricators.

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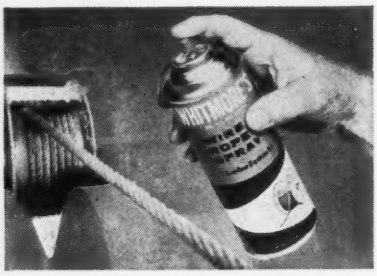
For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.



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Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Enclosed Gear Cases
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LUBRICATING ENGINEERS

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SOCIETY NEWS

National Membership Drive Announced

"One good idea and the know-how to make it work are a potent combination." With this as its theme, the ASLE Membership Committee has developed a national membership campaign. Chairman John Waite, Inland Steel Co. summarized the program's theory this way: "The key to a successful membership campaign is active participation by every Section in ASLE. Direct, personal contact of prospects by members is the most effective way to sell ASLE."

The program is basically a meeting program for the Section and a plan for attracting prospects to the meeting. Committee members John Ehret (Ehret & Kinsey), Hal Reigel (Humble Oil & Refining Co.), and A. B. Two (Motor Oils Refining Co.), have developed a blueprint for organizing the campaign and conducting the meeting. Promotion materials include sample letters to members and prospects, a special flyer announcing the meeting, and a time table for putting the plan into effect.

The National Office will supply the meeting program itself. A National Officer will present a talk on ASLE activities illustrated by color slides. A question and answer session will follow on national and local activities, with Section Officers participating. The program is concluded with a technical film on a lubrication subject.

The "One Good Idea" theme has been used throughout the campaign. A new membership brochure is in process with that as its title, and the presentation by National Officers has been designed around it.

Mr. Waite explained, "ASLE is essentially an information gathering and disseminating organization. Our stock and trade is ideas. The value of a good idea will more than repay all the costs of membership for many years. Members need only one good idea to make ASLE worthwhile. But, active members are exposed to hundreds of ideas during the course of a year."

The Committee is working on plans for assisting the Sections to broaden their base of interest and support. A profile of members is being considered which can be used to compare industries represented against industries in the Section area. "This has the potential of giving direction to our campaign and uncovering many new prospects," said John Ehret.

(*Continued on page* 407)

SOCIETY NEWS

(*Continued from page* 406)

"This is essentially a marketing problem," commented Hal Reigel. "The toughest job will be pinpointing our areas of weakness in terms of industries which benefit from ASLE's reservoir of information, and then telling them about it effectively."

The consensus of the Committee is that when engineers know about ASLE and its activities, they are eager to join. This is borne out by the many membership applications and inquiries received in the National Office each week which are unsolicited.

Enthusiastic support from the Sections is anticipated. "In the first ten days after the announcement of the program, three sections have already signed up," commented Don Sanberg, ASLE Executive Secretary. "Doing this membership job well will tax the resources of some of our smaller Sections. In a few cases, every member will be called on to do more than just try to bring a prospect to the meeting. We are ready to back up these Sections with all the resources of the National Office. All that is necessary for immediate assistance is a letter or phone call outlining the problem. We will take it from there."

SECTION NEWS

Philadelphia—The first meeting of the 1961-62 season will be held on Thursday, October 19, at McCallister's, 1819 Spring Garden Street, Philadelphia. The usual time schedule is as follows:

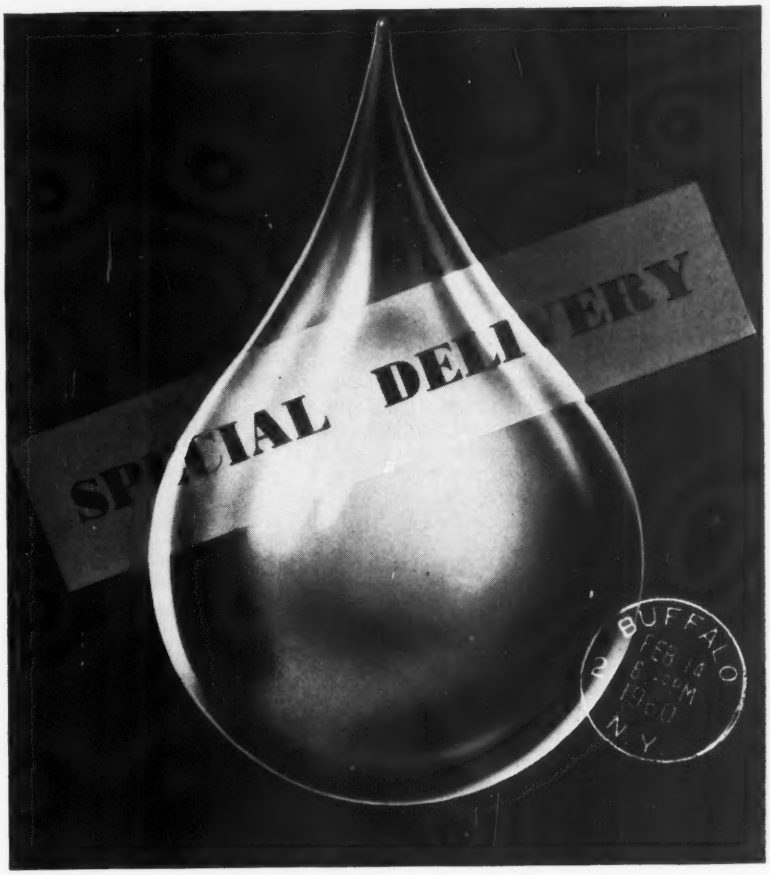
6:00 P.M.—Social Hour
6:30 P.M.—Dinner
7:30 P.M.—Business Meeting
8:00 P.M.—15-Minute Break
8:15 P.M.—Program
10:30 P.M.—Adjournment

The program for that night will consist of two speakers: Mr. Robert G. White, Div. Mgr., Vickers, Inc., Division of Sperry Rand Corp., will discuss Pumps, and Mr. Richard J. Koerwer, Chief Engineer, Philadelphia Div., Mobil Oil Company, will discuss Hydraulic Fluids.

This meeting will be a joint meeting between the Philadelphia Sections of ASLE and ASME.

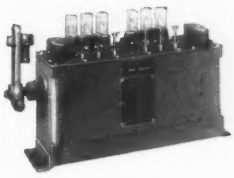
Houston—The October 2, 1961 meeting will be held at the Houston Engineering and Scientific Society Building. The subject, "Oil Additives," will be discussed by Mr. L. L. Leach of Humble Oil Company.

HOW FAST should you



deliver a drop of oil?

Whether you're operating high-compression diesels or fast-moving shear knives, you're probably paying more and more attention to lubrication *timing*. Whatever your field, our engineers will be glad to study your requirements and make specific recommendations. Your needs can be met either by adapting an existing model — or we will custom-build you your own lubricating system. Write for our catalog. Manzel, 254 Babcock Street, Buffalo 10, New York. You will get exact, on-time lubrication if you



ask the man from

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Manzel

SPECIALISTS IN LUBRICATORS AND METERING PUMPS SINCE 1898

How to get a pump and motor into the smallest possible space

by E. H. Schanzlin
Chief Engineer, Tuthill Pump Company

Today's designer faces stringent limitations on space and weight in more and more of his assignments. Miniaturization is the order of the day. Even if we exclude rockets, missiles, aircraft and similar applications, reducing the size and weight of pump and motor combinations can result in significant savings.

Compactness simplifies assembly operations . . . lowers production costs. Reduced weight means lower shipping expense. Elimination of components such as couplings, bases and adapters can mean substantial savings. And often a compact unit can provide the only feasible answer to a tough design problem.

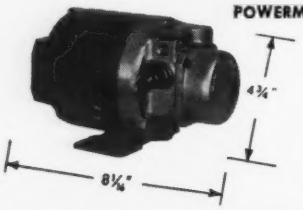
Special Combinations Developed

Five years ago, Tuthill's engineering department initiated a special program to develop compact pump and motor combinations to provide the greatest possible savings in space and weight. The units on this page, plus others in our stock and on the drawing boards, are a result of this intensive and continuing program.

Powermite for OEM

For original equipment applications involving substantial quantities, Tuthill's engineers have developed a special design in which the pump and motor are combined in one unit which takes up no more space and

POWERMITE

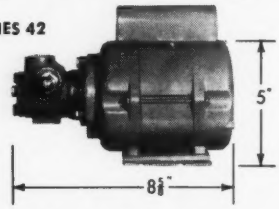


weighs no more than a standard electric motor. The typical Powermite above, used in a hydraulic application, has a capacity of 16 gph at 350 psi despite its small size. Each Powermite is specially designed to meet the exact requirements of a specific OEM application.

Standard Units from Stock

In addition, Tuthill provides a wide selection of standard combinations immediately available from stock. Unlike the Powermite, the stock combinations can be furnished in single units, or any desired quantity.

SERIES 42



Here is a typical combination . . . series 42 totally enclosed ball bearing motors supplied with ratings from 1/12 to 1/6 hp, in combination with pumps with capacities of 20 to 45 gph at pressures to 200 psi.

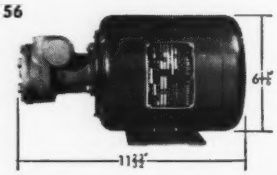
Series 48 Combinations

A selection of series 48 combinations are normally supplied with totally enclosed fan-cooled motors of either split phase, capacitor or 3 phase construction, with ratings from ¼ to ½ hp. Pumps supplied in these combinations range from 20 gph to 360 gph at pressures to 360 psi. A typical combination measures only 7⅝" x 10 7/16".

Series 56 Units Available

Series 56 units measure 6 11/16" x 11 23/32" as shown. They are offered in a complete range of motors from ¼ to 1 hp . . . which can be coupled with pumps with capacities from 20 to 360 gph at pressures to 500 psi.

SERIES 56



Many Others Available

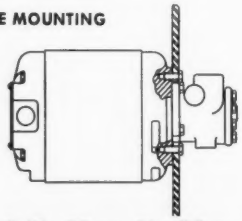
Many other pump and motor combinations are available with capacities up to 50 gpm and for pressures to 500 psi. A new selection of closed coupled units will soon be offered with motor ratings to 5 hp.

Motors are normally furnished for 1725 rpm. However, they are usually available for 3450 and 1140 rpm as well. Explosion proof construction and double shaft extensions on motors are also furnished. Built-in relief valves and other modifications are optional.

Special Flange for Plate Mounting

For many applications a special mounting for close-coupled pump-motor combinations offers distinct advantages. Shown below, it allows the pump and motor to be mounted on any plate of sufficient thickness to bear the weight of the unit, by simply cutting a circular hole of sufficient size to allow the passage of the pump. It is particularly convenient for mounting on tanks, where it greatly simplifies piping arrangements. Through elimination of mounting flanges it further reduces space and weight.

PLATE MOUNTING



Send Us Your Problem

In addition to these, Tuthill has developed a wide range of solutions to special problems involving pump-motor combinations. If you are trying to fit a pump and motor into a small space, take advantage of our experience. Write and give us the details.

Tuthill manufactures a complete line of positive displacement rotary pumps in capacities from 1/3 to 200 gpm; for pressures to 1500 psi; speeds to 3600 rpm.

PUMPS FOR YOUR PURPOSE

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971 East 95th Street, Chicago 19, Illinois

Plan to attend the

8th Annual Lubrication Conference

at the
MORRISON HOTEL
in
CHICAGO

October

17, 18, 19, 1961

This important conference will be devoted to the lastest research and development studies in the field of lubrication.

Registration fee is $5.00 for members and $7.00 for non-members.

ASLE **ASME**

Twenty ASLE Papers to be presented at the 1961 Lubrication Conference in Chicago, October 17, 18, 19, 1961

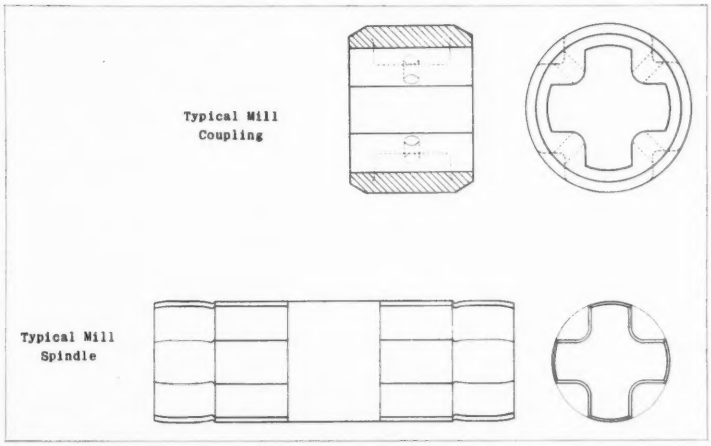
Preprints of the ASLE papers that will be presented at the Conference will be available at the Conference for those attending. They will also be available at the ASLE National Office, 5 North Wabash Ave., Chicago 2, Ill., after October 15, 1961. Papers ordered by mail are priced at 50¢ each to members and $1.00 to non-members (not 75¢ to non-members as indicated in advance program). Order by paper number.

HODSON SPINDLE AND COUPLING BOX COMPOUND

Maintenance Costs Reduced

Stop Spindle and Coupling Wear by using HODSON No. 4025 SPINDLE AND COUPLING BOX COMPOUND—a tough, resilient, E.P. (extreme pressure) Compound for Mill—Lead—or Pinion Spindles.

1. **Labor and material costs but a few dollars per week per spindle application.**
2. **May be pumped to pods without disassembling equipment.**
3. **A full schedule of turns per application with no down time.**
4. **Roll changes easy and clear—no throw-off.**



Hodson No. 4025 Spindle and Coupling Box Compound specifically designed and test proven eliminates wear, noise, and of course, blacklash.

Hodson No. 4025 Spindle and Coupling Box Compound may be swabbed or pumped directly to the spindle and coupling boxes during mill changes.

CASE HISTORY—A 24" Cross Country Mill—18" Spindles, shows savings of several hundred dollars per annum in replacement and rebuilding or reclaiming of spindles and couplings.

Demonstration of suitability of material, or trial sample if desired, upon request.

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Colloidal Natural Graphite

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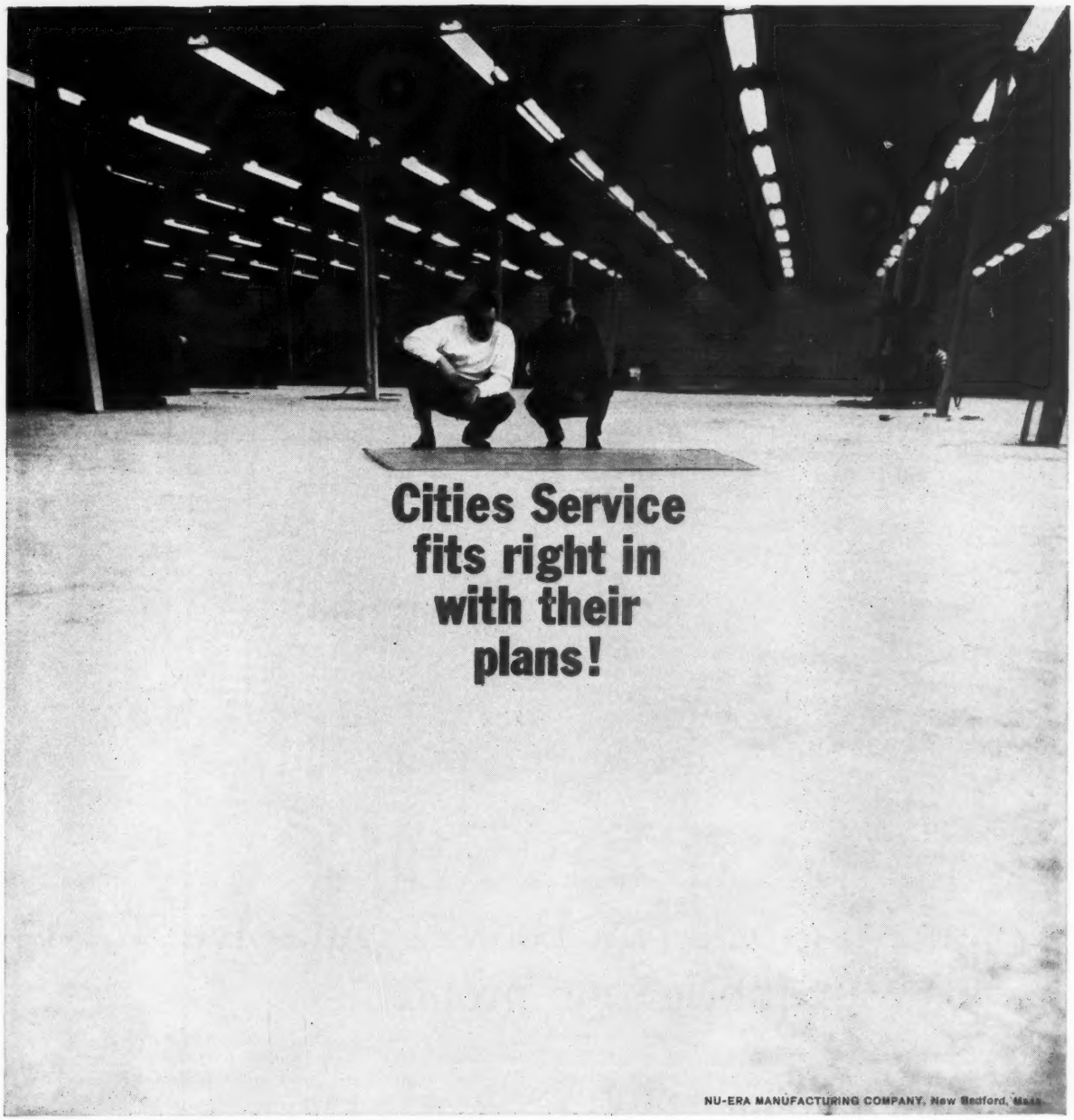

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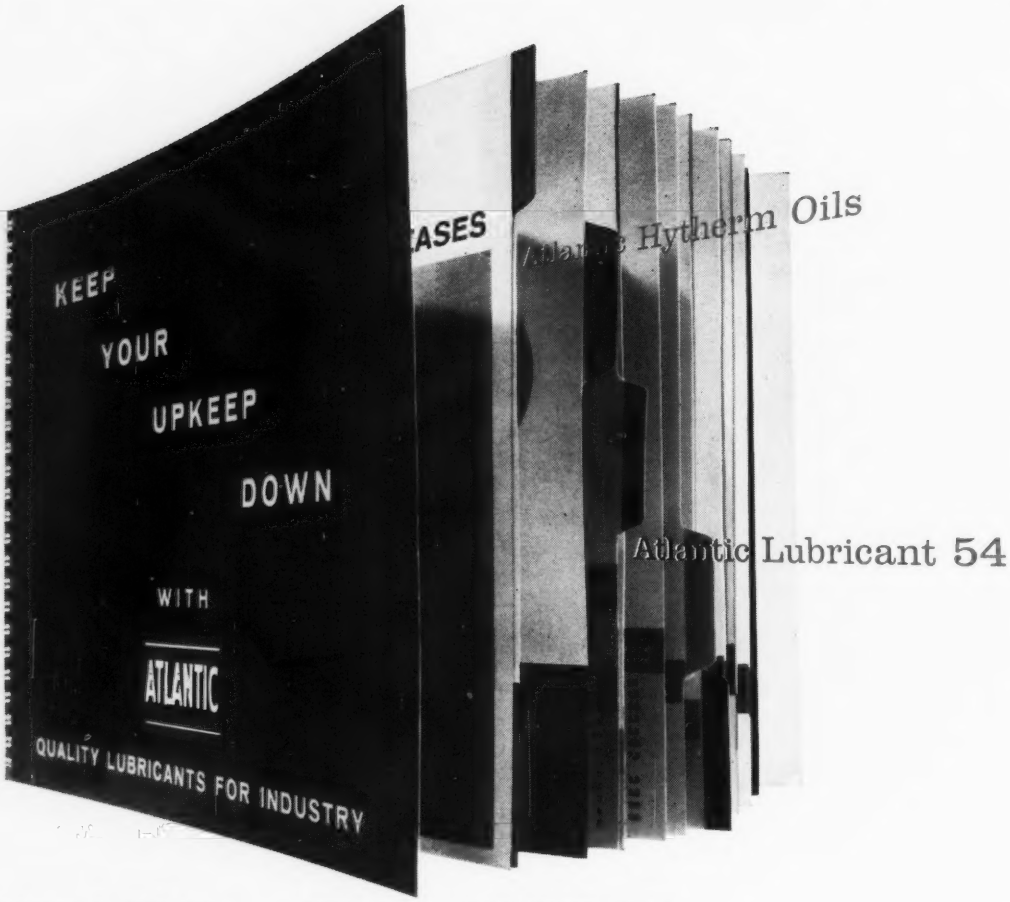

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Evaluation of DRAWING LUBRICANTS *for Tantalum and Uranium**

by R. I. Batista, Gale S. Hanks, James M. Taub
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Tucson, Arizona

A simplified testing device utilizing a draw bench and readily available auxiliary components has been developed for evaluating the friction reducing characteristics of possible lubricants for use with usual metals and alloys for which such information has not yet been developed. Data have been obtained for a variety of lubricants and die materials employed with tantalum and uranium, two such metals for which additional forming information has been needed. The device and procedure provides a means for extensive evaluation of other combinations of dies, lubricants, and metals.

INTRODUCTION

The increasing use of unusual metals and alloys for which lubrication data have not been established indicated the need for an evaluation of various die lubricants to facilitate lubrication processes.

This paper specifically concerns the evaluation of lubricants for the lubrication of tantalum and uranium, though the equipment and procedures were developed to allow nearly any combination of dies, lubricants, and metals to be tested.

Possible approaches were considered which would afford an insight into the frictional behavior of these metals under conditions of loading and lubrication generally similar to the type encountered in practice. Review of the literature revealed a previous approach had been made to the problem of evaluating drawing lubricants (1). A modified arbor press had been used to apply pressure normal to the lubricated surfaces of metal test strips as they were drawn through a variety of dies. The investigation developed information on the performance of various types of lubricants under the conditions applied and indicated the feasibility of obtaining such data by means of a test of this kind.

Using a method similar to the referenced approach, a number of lubricants were tested on tantalum and uranium using several die materials. These data allow specific recommendations to be made concerning the working of these metals.

EQUIPMENT AND PROCEDURE

For the data sought in the present investigation, the arrangement decided upon was quite simple and made use of existing equipment through minor adaptation. A hydraulically-operated draw bench of 25,000 inch-pound capacity was used to pull the metal test strips through die faces machined from several selected die materials. The metal test strips were prepared in 2 in. widths from 0.072 in. thick stock and were 4 feet in length. Their surfaces were generally in the as rolled condition, though some anodized tantalum strips were tested for comparison purposes.

The anodized surface was obtained by making the chemically clean surface anodic in a 1.0% H_2SO_4 solution at 120 volts for ten minutes.

The dies employed were 4 in. in width by 2 in. deep in surface area and were machined, respectively, from tungsten carbide, from mild steel plated with chromium, and from an aluminum bronze containing 80% copper, 15% aluminum, and 5% iron. All die faces were surface ground.

*Work performed under the auspices of the Atomic Energy Commission.

Hardness and surface finish data for the dies and specimens are presented in Table 1.

TABLE 1.—HARDNESS AND SURFACE FINISH OF DIES AND SPECIMENS

MATERIAL	HARDNESS RA	SURFACE FINISH PARALLEL TO THE DRAW FORCE —MICRO-INCHES	SURFACE FINISH NORMAL TO THE DRAW FORCE —MICRO-INCHES
Al-Bronze dies	70	8	10
Mild Steel dies	53	10	25
Tungsten Carbide dies	—	20	20
Tantalum Test Strips	62	15	40-50
Uranium Test Strips	72	30-40	30-40

Fig. 1 shows a schematic arrangement of the test setup. A two-block hydraulic press rig was positioned in front of the pulling jaws of the draw bench (Fig. 2). A hand operated hydraulic jack applied up to 50 tons of pressure between selected die inserts which in turn provided the necessary range of normal pressure against the metal test strips. Pressure transducers were incorporated to measure both normal pressure and draw pressure, the two variables of interest. Signals from the transducers were supplied to an X-Y recorder. The two channels controlled the movement of a drum for normal pressure and a pen for draw pressure, respectively. The drum was calibrated with a precision gauge to record normal pressures over the range of 0-5000 psi. Likewise the pen recorded draw pressures over the range of 0-2500 psi. The actual normal pressures on the specimens were 0-6000 psi. During test runs, 8½ in. x 11 in. graph paper was used to record the pen traces.

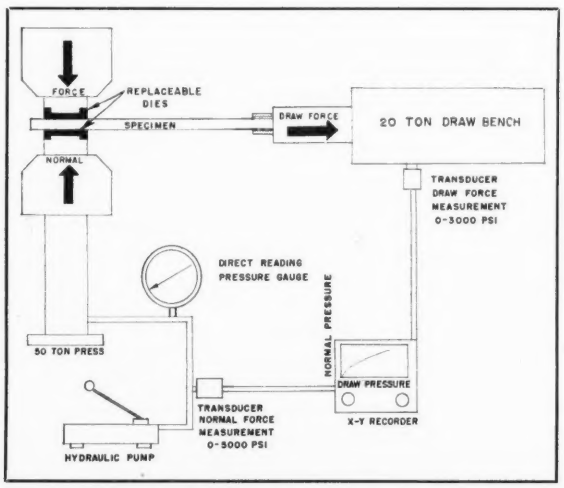

Fig. 1. Schematic Drawing of the test setup. The strip specimen is drawn through dies by the draw bench while a X-Y recorder traces the test pressures supplied from transducers.

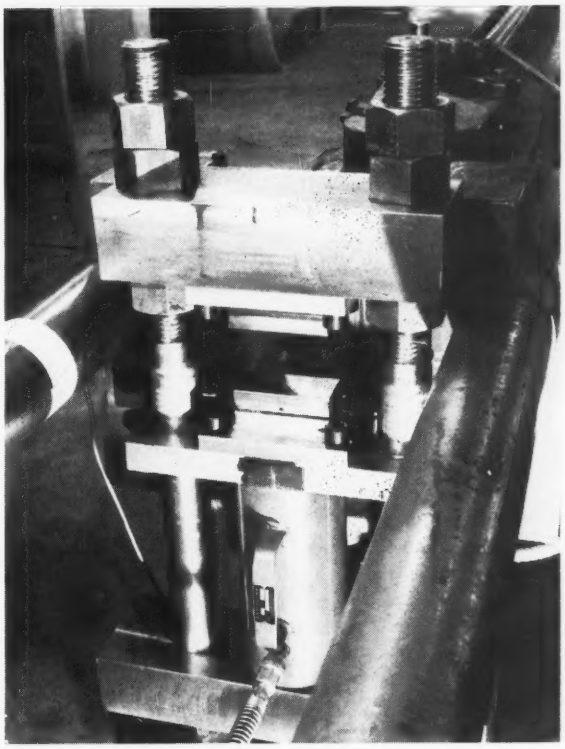

Fig. 2. The 50 ton press butted against the draw bench. A pair of aluminum bronze dies are shown in place ready to receive a lubricated specimen.

TABLE 2.—DESCRIPTION OF DIE LUBRICANTS

DIE LUBRICANT NUMBER	DESCRIPTION
1.	A proprietary viscous liquid applied over a special hard surface precoat.
2.	A commercial die lubricant of paste-like consistency.
3.	Equal parts of No. 1, viscous liquid, and beeswax applied over a special hard surface precoat.
4.	Colloidal graphite in water—Meets Mil-G-13912(ORD)
5.	Colloidal graphite in naphtha—Federal Stock No. 9150-551-9328.
6.	An imported proprietary viscous liquid specially developed for tantalum lubrication.
7.	A suspension of MoS_2 in a heavy petroleum base carrier. Mee's Nav ORD Standard OSTD 600, pg. 31-12.02 (INT) P/N 12-Z-3100-12.
8.	A suspension of MoS_2 in a volatile hydrocarbon base carrier. Meets Mil-L-7866 A or B.
9.	A commercial machinery grease—Federal Stock No. 9150-527-1752. Mineral oil and calcium soap.
10.	Beeswax
11.	Glycerine.
12.	Equal parts of glycerine, kerosene, and beeswax.
13.	Equal parts of No. 1, viscous liquid, and beeswax. No hard surface precoat was used.
14.	Equal parts of beeswax, trichloroethylene, and glycerine.
15.	Equal parts of No. 4, colloidal graphite in water, and No. 9, commercial machinery grease.

Table 2 lists the lubricants tried in the various tests. These vary from commercial drawing compounds to composites developed by trial and error. Some of the lubricants were known to be satisfactory for lubricating tantalum and uranium and were included for comparison purposes.

The test procedure followed consisted of applying a selected lubricant to both faces of a metal test strip and then positioning the strip between the die faces. In general, the lubricants were applied with a rag or brush and tested immediately. Exceptions are noted below:

1. Die Lubricants 1 and 3 required the use of a hard surface precoat which was allowed to dry 30 minutes before the application of the top coat.
2. Die Lubricants 4 and 5, colloidal graphite in water and naphtha, were allowed to dry before testing.
3. Die Lubricant 10, beeswax, was applied to test strips and heated just warm enough to melt the wax. The strip was then quenched in cold water.

A 600 psi pre-load normal pressure was applied on the press before the draw bench was operated. A draw speed of 2 ft per min was set on the draw bench. This is the same ram speed being used for the deep drawing and ironing of tantalum and uranium.

As the strip began to be drawn through the die faces, the normal pressure was increased to 250 psi increments with a pause at each step to allow the recorder to stabilize. During each test run, three separate traces were recorded and these generally were found to superimpose on one another indicating good reproducibility for the test. Fig. 3 shows typical samples of test traces. An average curve for each test was obtained by drawing a representative line through the three experimental traces.

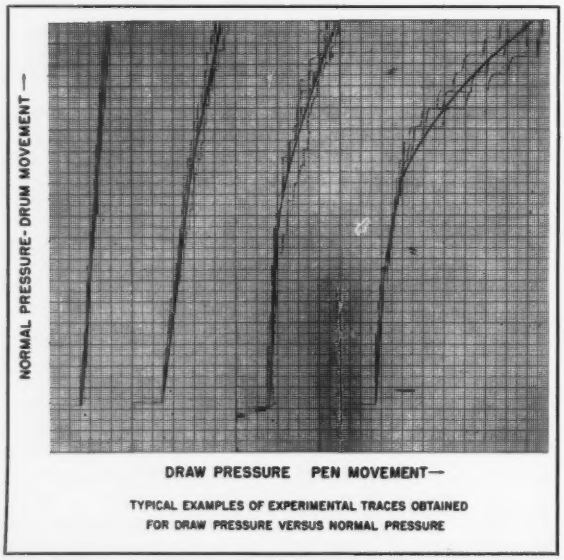

Fig. 3. This figure represents, from left to right, good to poor traces. The dark line is the average of the three experimental curves.

RESULTS AND DISCUSSION

Six arbitrary values (600, 1000, 2000, 3000, 4000, and 5000 psi) of normal pressures were chosen on the average curve obtained for each test and the corresponding draw pressure noted. These co-ordinates were converted into actual stresses on the test strips and final curves were constructed from these data.

The final curves for uranium and tantalum are shown in Figs. 4 & 5. These profiles provide a ready indication of the friction reducing properties of the various lubricants and combinations of lubricants.

For tantalum, lubricant combinations containing beeswax provide the best performance of those tested. Their profiles show low draw pressures over the whole range of normal pressures applied. Additions of kerosene, glycerine, trichloethylene and several forms of commercial lubricants varied the test behavior somewhat, but not appreciably. However, these combinations were easier to apply than pure beeswax. After testing, the test strips coated with beeswax and beeswax base lubricants still had an obvious coating of lubricant. Generally, this was not true with the other lubricants tested.

The two proprietary viscous liquids, lubricants 1 and 6, compared with the poorer of the beeswax combinations.

In sharp contrast, the tests show the considerably poorer friction reducing properties of the other lubricants tested. The dies tended to strip these lubricants off the test strips exposing some bare metal which caused higher draw pressures.

All curves shown for tantalum were obtained with dies of the aluminum bronze composition. The tungsten carbide and mild steel dies galled and seized with tantalum at very low normal pressures, of the order of 700 psi. This was true of all the lubricants tested using these two die materials.

These results are borne out by actual deep drawing practice in which beeswax and beeswax combinations have been observed to serve as the best lubricants for this type of forming. The viscous liquids, lubricants 1 and 6, have worked very well during swaging operations.

For uranium, the slopes of the profiles are generally higher than those for tantalum, indicating that somewhat more difficulty still exists in developing a good lubricant for use with this metal. Here again, however, beeswax showed up very well when used with aluminum bronze dies. Several other lubricants also showed promise, particularly lubricant no. 4, colloidal graphite in water. A combination of lubricants no. 4 and no. 9, commercial machinery grease, also gave good results when used with chromium plated mild steel dies. Lubricant no. 1, a viscous liquid, performed well at lower normal pressures, and, with the addition of beeswax, gave good results at the maximum test pressures.

As with tantalum, the uranium results generally correspond to actual practice. Lubricant no. 4, colloidal graphite in water, is used by itself and in combination with commercial machinery grease as a deep drawing lubricant for uranium. Unlike the behavior observed with tantalum in which only aluminum bronze dies could be used, data for uranium was obtained for dies of tungsten carbide and for mild steel plated with

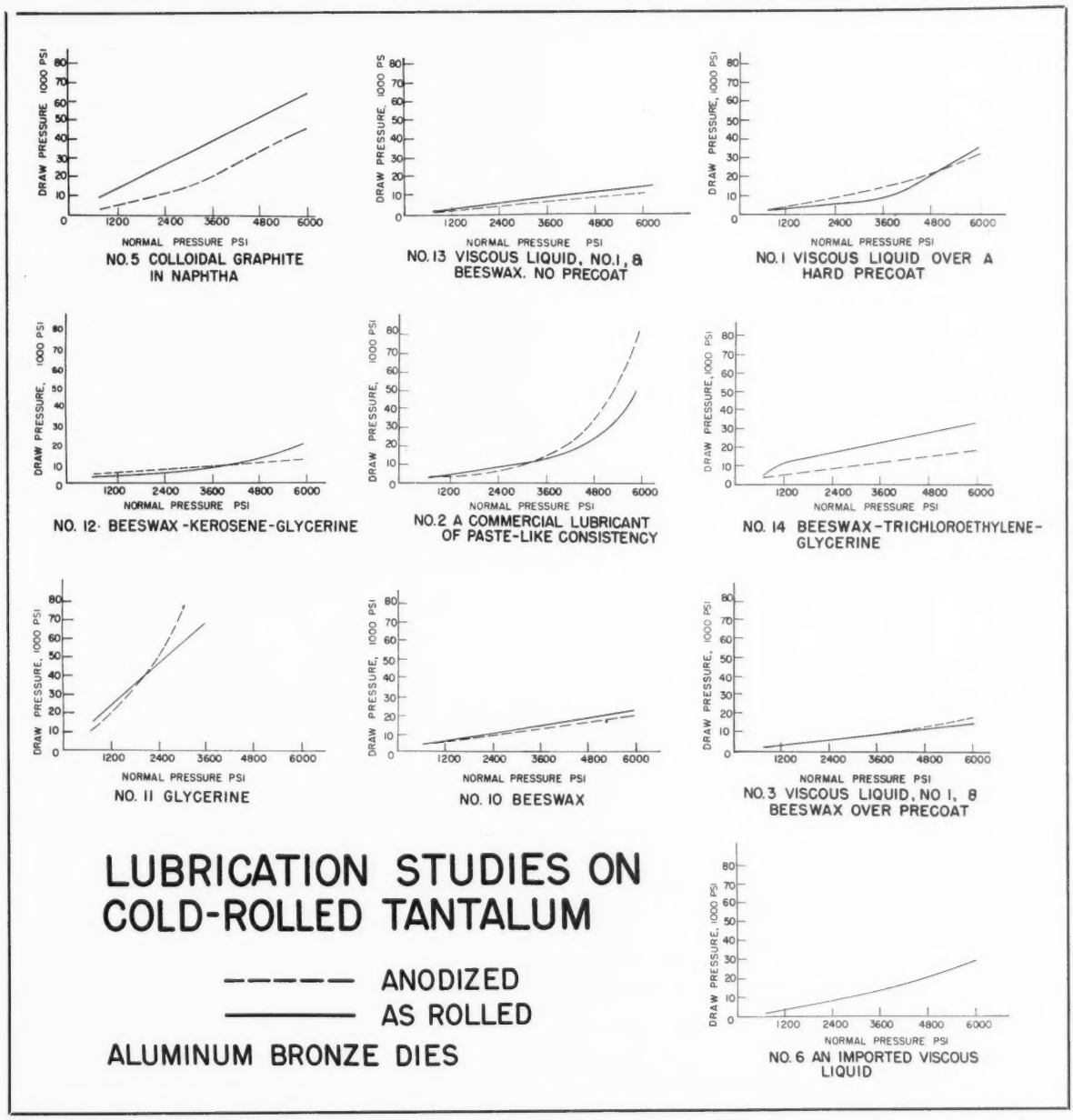

Fig. 4. Normal pressure vs draw pressure for tantalum. The beeswax and beeswax base lubricants provided the best performance. Two proprietary lubricants, numbers 1 and 6, are not as satisfactory, but are easier to apply.

chromium. It may be noted that the friction reducing behavior was quite varied for the different combinations of die material and lubricant, though no correlation of these variables is evident.

The extent of data obtainable through evaluation of various combinations of lubricants, die faces, and surface finishes is infinite. However, judicious grouping and classification should indicate useful trends and minimize the number of tests necessary to establish optimum lubrication conditions.

Generally, a straight line relationship does not exist between draw pressure and normal pressure, and thus, interpretations in terms of the coefficient of friction must specify the range or normal pressure applied. The value of the profile data obtainable lies in the relative and comparative nature of the friction reducing trends they provide, rather than as absolute information.

CONCLUSIONS

A simple and feasible method for evaluating the friction reducing characteristics of possible lubricants and die materials for the use with unusual metals and alloys has been developed.

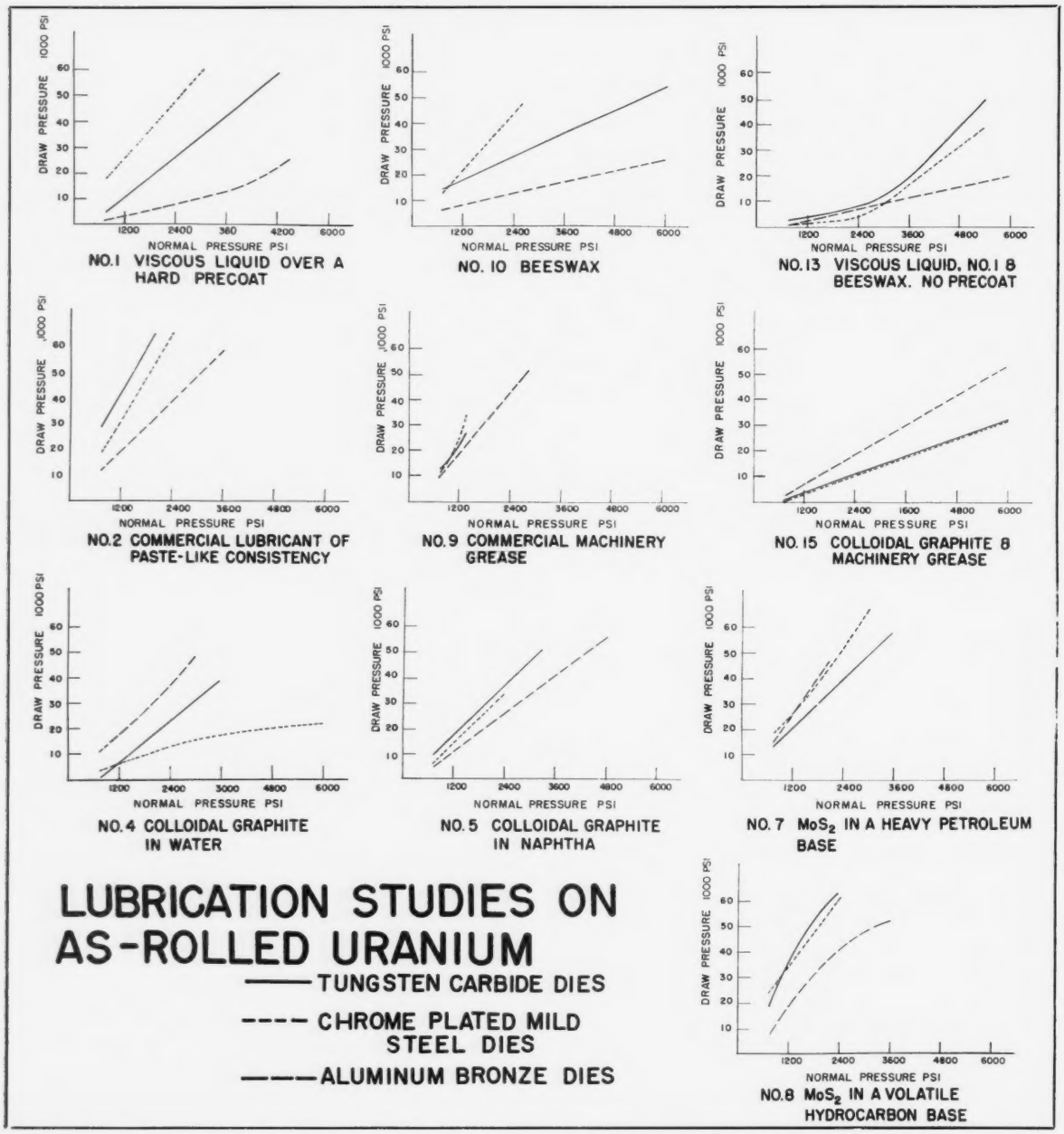

Fig. 5. Normal pressure vs draw pressure for uranium. These curves indicate that colloidal graphite in water used with tungsten carbide dies and beeswax used with aluminum bronze dies provided the best antifriction properties of the lubricants tested.

Specific results were obtained for the lubrication of tantalum and uranium. Beeswax and beeswax base lubricants used with aluminum bronze dies provided the best friction reducing combinations for forming these metals. Colloidal graphite in water used on chromium plated steel dies and beeswax used on aluminum bronze dies were the most satisfactory combinations for lubricating uranium.

Since these results are generally consistent with known practice, the procedure described should be suitable for testing many combinations of metals, lubricants, and die materials.

ACKNOWLEDGMENT

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(E. J. Krabacher)

CITIES SERVICE PETROLEUM, INC.
Cities Service Research & Development Co.
Box 402
Cranbury, New Jersey
(H. G. Schultz, Jr.)

THE ELCO LUBRICANT CO.
Denison Rd. & Jennings Ave.
Cleveland 9, Ohio
(George Hoffmann)

ESSO STANDARD DIVISION
Humble Oil & Refining Co.
34th & Smallman Streets
Pittsburgh 1, Pennsylvania
(Michael M. Gurgo)

THE FARVAL DIVISION
Eaton Mfg. Company
3249 East 80th Street
Cleveland 4, Ohio
(Edward J. Gesdorf)

GARLOCK INC.
Palmyra, New York
(E. W. Fisher)

GULF OIL CORPORATION
P.O. Box 2140
Houston 1, Texas
(Edwin W. Campbell)

HODSON CORPORATION
5301 West 66th Street
Chicago 38, Illinois
(Walter H. Hodson)

E. F. HOUGHTON & COMPANY
303 West Lehigh Avenue
Philadelphia 33, Pa.
(William Eismann, Jr.)

LINCOLN ENGINEERING CO.
4010 Goodfellow Boulevard
St. Louis 20, Missouri
(Robert E. Crean)

LUBRIZOL CORPORATION
29200 Lakeland
Cleveland 17, Ohio
(Peter A. Asseff)

NATIONAL CASH REGISTER CO.
Box 198
Dayton 7, Ohio
(Robert F. McKibben)

PAZ OIL COMPANY, LTD.
4 Vine Street
Haifa, Israel
(Y. Gavish)

SHELL OIL COMPANY
50 West 50th Street
New York 20, New York
(T. F. Shaffer)

SINCLAIR REFINING CO.
600 Fifth Avenue
New York 20, New York
(George E. Kellis)

SOCONY MOBIL OIL CO., INC.
150 East 42nd Street
New York 17, New York
(Robert Q. Sharpe)

STANDARD OIL CO. CALIF.
225 Bush Street
San Francisco 20, Calif.
(Frank R. Hart)

STANDARD OIL DIVISION
American Oil Company
910 South Michigan Ave.
Chicago 80, Illinois
(George F. Bowers)

SUN OIL COMPANY
1608 Walnut Street
Philadelphia, Pa.
(Bruce M. Dunham

TEXACO, INCORPORATED
135 East 42nd Street
New York 17, New York
(Fred Rosenstiehl)

TIMKEN ROLLER BEARING CO.
1835 Dueber Avenue S. W.
Canton 6, Ohio
(Howard T. Peeples)

TRABON ENGINEERING CORP.
28815 Aurora Road
Solon, Ohio
(E. W. Baumgardner)

U. S. STEEL CORPORATION
National Tube Division
327 Craft Ave.
Pittsburgh 13, Pa.
(Charles A. Bailey)

WESTINGHOUSE ELECTRIC CORP.
Research Laboratories
Beulah Road Churchill Borough
Pittsburgh 35, Pa.
(John Boyd)

WYNN OIL COMPANY
1151 West 5th Street
Azusa, California
(Gaylord E. Hold)

M E M B E R S

MARTIN L ABEL
PERMAWICK CO
5319 E OUTER DRIVE
DETROIT 34 MICH

STANLEY ABRAMOVITZ
CONTINENTAL BEARING RES CORP
501 FIFTH AV
NEW YORK 17 NEW YORK

LAWRENCE B ABRAMS JR
J P MURRAY CO
311 ROSS ST
PITTSBURGH 19 PA

NEWTON L ABRAMSON
BORNE CHEMICAL CO INC
632 SO FRONT ST
ELIZABETH NEW JERSEY

H E ACHILLES
TIDEWATER OIL CO
MARTINEZ CAL

A W ACKERMAN
ANDERSON OIL & CHEM CO
LINBERT ST
MIDDLETOWN CONN

WILLIAM ACOSTA
J V CALHOUN CO
349 MONTGOMERY AV
BALA CYNWYD PA

KENNETH W ADAMS
ATLAS STEELS LIMITED
WELLAND ONTARIO CANADA

VON L ADAMS
ST REGIS PAPER CO
P O BOX 1591
PENSACOLA FLORIDA

RAMON L ADDINWALL
STEEL CO OF CANADA LTD
81 IRENE AV
STONEY CREEK ONT CANADA

OTTO T AEGLI
MAGNUS PRODUCTS CORP
17350 RYAN ROAD
DETROIT 12 MICHIGAN

CLARENCE R AHLBERG
SUN OIL CO
42 CEDARWOOD RD
KENSINGTON CONN

DONALD O AKINS
MOBIL OIL CO
84 SOUTH 6TH ST
MINNEAPOLIS MINN

CLARENCE E ALBERTSON
BORG WARNER CORP
240 SOUTH MONTEREY AV
VILLA PARK ILL

CHARLES A ALDAG
ARCHER DANIELS MIDLAND CO
3300 WEST PETERSON SUITE A
CHICAGO 45 ILL

THOMAS L ALDRIGHETTI
100 COLBOURNE CRESCENT
BROOKLINE MASS

C ALBERT ALEXANDER
SUN OIL CO
215 DEERFIELD ROAD
COLUMBUS 4 OHIO

WILLIS R ALEXANDER
MACK TRUCKS INC
1120 SOUTH SECOND ST
PLAINFIELD NEW JERSEY

W A ALEXANDROFF
PATE DIV HUMBLE OIL & REF CO
12205 W UNDERWOOD PARKWAY
WAUWATOSA 13 WIS

JOHN M ALLAN
CANADIAN OIL COMPANY LTD
CORUNNA ONTARIO CANADA

C M ALLEN
BATTELLE MEMORIAL INSTITUTE
505 KING AV
COLUMBUS 1 OHIO

COY ALLEN
AMERICAN OIL CO
815 SUPERIOR AV SUITE 1823
CLEVELAND 14 OHIO

H W ALLEN
ALEMITE CO
2314 SHERMAN AV
EVANSTON ILL

T V ALLEN
BATTENFELD GREASE & OIL CORP
19530 SOUTH ALAMEDA
COMPTON CAL

EARL R ALLGEYER
THE MARLEY CO INC
222 W GREGORY
KANSAS CITY MISSOURI

JAMES ALLISON
WALLACE BARNES CO
274 SHERMAN AV N
HAMILTON ONTARIO CANADA

WILLIAM L ALLMAN
SOCONY MOBIL OIL INC
25 MACADAMS RD EDGEBROOK NO 1
FRAMINGHAM CENTER MASS

ALBERT G ALMACK
IMPERIAL OIL LTD
150 LAIRD DRIVE .
TORONTO ONTARIO CANADA

GABRIEL C ALMASI
CRUCIBLE STEEL CO OF AMERICA
RD 1 DUTCH RIDGE RD
BEAVER PENNSYLVANIA

E M ALTHAR
CITIES SERVICE OIL CO
P O BOX 1117
SHREVEPORT LOUISIANA

ANTHONY C AMADDIO
THE F D JOHNSON CO
28815 AURORA ROAD
SOLON OHIO

DON A AMANN
CAL CHEMICAL CO ORONITE DIV
8514 EAST 31ST ST
TULSA 45 OKLA

GENE D AMANTE
ENJAY CHEMICAL CO
651 EUCLID
GLEN ELLYN ILL

A E ANDERSON
THE FAFNIR BEARING CO
BOOTH ST
NEW BRITAIN CONN

JAMES L ANDREW
THE PURE OIL CO
200 EAST GOLF ROAD
PALATINE ILL

A O ANDERSON
ALUMINUM COMPANY OF AMERICA
2210 HARVARD AV
CLEVELAND OHIO

JOSHUA E ANDERSON
ARMCO STEEL CORP
705 CURTIS ST
MIDDLETOWN OHIO

KENNETH S ANDERSON
TWIN CITY TESTING & ENGRG LAB
2440 FRANKLIN AV
ST PAUL 14 MINNESOTA

R W ANDERSON
22 BEECH LANE
METUCHEN NEW JERSEY

WILLIAM J ANDERSON
NATL AERONAUTICAL SPACE ADM
5082 WHITETHORN AV
NORTH OLMSTED OHIO

RAYMOND K ANDREW
U S OIL CO
BOX 1345
PROVIDENCE RHODE ISLAND

ROBERT G ANDREWS
SUN OIL COMPANY
1608 WALNUT ST
PHILADELPHIA 3 PA

JOHN K APPELDOORN
ESSO RESEARCH & ENGRG CO
P O BOX 51
LINDEN NEW JERSEY

ALBERT G APPS
INTERNATIONAL HARVESTER
1010 E 73RD ST
CHICAGO 19 ILL

WENCESLAO F AQUINO
CALTEX PHILIPPINES INC
540 P FAURA
ERMITA MANILA PHILIPPINES

GEORGE R ARBOCUS
E F HOUGHTON & CO
303 W LEHIGH AV
PHILADELPHIA 33 PA

FRANK R ARCHIBALD
AC SPARK PLUG DIV GMC
4443 NORTH STOWELL
MILWAUKEE 11 WIS

W LELAND ARCHER
CR CALTEX PHILIPPINES INC
P O BOX 783
MANILA PHILIPPINES

DONALD J ARMSTRONG
FARMERS UNION CENTRAL EXCH INC
P O BOX G
ST PAUL 1 MINNESOTA

ELTON L ARMSTRONG
SOCONY MOBIL OIL CO INC
P O BOX 91
MULLICA HILL NEW JERSEY

RAY NORMAN ARONSON
MIDLAND COOPERATIVES INC
56 HIWAY 100
FRIDLEY MINNESOTA

EDWARD F ARPS
ESSO STD OIL CO
117 LEXINGTON ST
WAVERLY 79 MASS

RONALD E ARTHUR
JOHN SPOTTON CO LTD
21 CARSON ST
TORONTO ONT 12 CANADA

AHMED HUSSEIN ASFOUR
STE EGYPT D ENGR ET D INDUST
CHIMIQUES
SUEZ EGYPT

JAMES A ASHBAUGH
MINSTER MACH CO
316 SOUTH WALNUT ST
NEW BREMEN OHIO

WM L ASHBY
MOHAWK REFINING CORP
472 FRELINGHUYSEN AV
NEWARK NEW JERSEY

HENRY C ASKEGAARD
SHELL OIL CO
1000 44TH STREET PL
DES MOINES 11 IOWA

P A ASSEFF
THE LUBRIZOL CORPORATION
EUCLID STATION BOX 3057
CLEVELAND 17 OHIO

FRED W ASTON
KRAFT FOODS LTD
3338D ROSEMOUNT BLVD
MONTREAL QUE CANADA

MERLE ATEN
CONTINENTAL OIL CO
4021 N HAMLIN AV
CHICAGO 18 ILL

CHARLES I ATHERTON
BOWSER INCORPORATED
420 LEXINGTON AV
NEW YORK 17 NEW YORK

EDSON T ATKINSON
WALLINGFORD STEEL CO
665 CENTER ST
WALLINGFORD CONN

R E OBRIEN
UNION OIL CO OF CALIF
5885 HOLLIS ST
OAKLAND CAL

RALPH C AXSOM
SOUTHWEST GREASE & OIL CO
6237 ANITA DRIVE
PARMA HEIGHTS 30 OHIO

MELVIN A AYERS
STANDARD OIL CO RICHMOND REF
WESTERN OPERATIONS
RICHMOND CAL

BURL B BABER
SOUTHWEST RESEARCH INSTITUTE
8500 CULEBRA
SAN ANTONIO TEXAS

EDWARD BAHLEDA
I T E CIRCUIT BREAKER CO
645 E ERIE AV
PHILADELPHIA 34 PA

CHARLES A BAILEY
U S STEEL CORPORATION
327 CRAFT ST
PITTSBURGH 30 PA

NORMAN CARLYLE BAILEY JR
TIDEWATER OIL COMPANY
660 MADISON AV
NEW YORK 21 NEW YORK

ROGER P BAIRD JR
TEXACO INCORPORATED
BOX 9078
RICHMOND 25 VIRGINIA

ALBERT A BAKER JR
AMERICAN BRASS CO
75 LIBERTY ST
ANSONIA CONN

ALBERT E BAKER JR
GENERAL ELECTRIC CO
OFF COUNTY ROAD
IPSWICH MASS

EDWIN J BAKER JR
THE AMERICAN LUBRICANTS CO
1227 DEEDS AV
DAYTON 4 OHIO

GILBERT L BAKER
ALUMINUM CO OF AMERICA
2210 HARVARD AV
CLEVELAND 5 OHIO

WARREN V BAKER
DRAPER CORPORATION
25 HOPEDALE ST
HOPEDALE MASS

L BALDEE
KENNECOTT COPPER CORP
403 NORTH 11TH W ST
SALT LAKE CITY 16 UTAH

L A BALLARD
ALEMITE CO OF BOSTON
64 CUMMINGTON ST
BOSTON MASS

LEE BALLARD
TIDEWATER OIL CO
660 MADISON AV
NEW YORK 21 NEW YORK

JOHN R BALLENTINE
CENTRAL PETROLEUM CO
R D 2
ANDOVER OHIO

NORMAN F BALLENTINE
CENTRAL PETROLEUM CO
5710 SUSAN DRIVE E
INDIANAPOLIS 20 IND

TIMOTHY P BALLENTINE
CENTRAL PETROLEUM CO
KIMBERLY DR R D 2
WILLOUGHBY OHIO

RUSSELL F BALOW
SOCONY MOBIL OIL CO
150 EAST 42ND ST
NEW YORK 17 NEW YORK

ROBERT P BAMVAKAIS
LINCOLN ENGINEERING CO
4010 GOODFELLOW BLVD
ST LOUIS 20 MISSOURI

EDWARD A BANIAK
TEXACO RESEARCH CENTER
P O BOX 509
BEACON NEW YORK

THOMAS A BANKS
E I DU PONT DE NEMOURS CO INC
SEAFORD DELAWARE

L B BARANOWSKI
BOWSER CO S F LIMITED
344 SHERMAN AV N
HAMILTON ONT CANADA

JOHN R BARCLAY
THE IRONSIDES CO
410 NORWOOD AV
YOUNGSTOWN 4 OHIO

JOSEPH F BARDSLEY
STANDARD OIL CO OF N J
500 NORTH BROAD ST
ELIZABETH NEW JERSEY

DEAN C BARDY
THE LUBRIZOL CORP
BOX 3057
CLEVELAND 17 OHIO

THOMAS BARISH
3210 WARRENSVILLE CENTER ROAD
CLEVELAND 22 OHIO

GEORGE E BARKER
VAN STRAATEN CHEMICAL CO
630 WEST WASHINGTON ST
CHICAGO 4 ILL

VICTOR A BARKER
BRITISH AMERICAN OIL CO LTD
CLARKSON REFINERY
CLARKSON ONT CANADA

JOHN W BARNA
UNION CARBIDE CHEMS CO
P O BOX 8004
SOUTH CHARLESTON W VIRGINIA

NORRIS C BARNARD
ESSO STD DIV HUM OIL & REF CO
15 WEST 51ST ST
NEW YORK 19 NEW YORK

MILTON BARNES
ROMAC OIL CO
1322 REXWOOD
WEST COVINA CAL

ROBERT E BARNUM
ESSO RESEARCH & ENGRG CO
ESSO RESEARCH CENTER
LINDEN NEW JERSEY

ANDREW R BARR
ESSO STD OIL CO
133 FARMEDGE ROAD
LEVITTOWN NEW YORK

WILLIAM A BARR
ATLAS POWDER CO
TECHNICAL CENTER
WILMINGTON 99 DELAWARE

THOMAS F BARRETT
MEALEY GREASE & OIL CO
17509 S MILES ROAD
CLEVELAND 28 OHIO

HOWARD JAMES BARROWCLOUGH
BERKSHIRE HATHAWAY INC
97 COVE ST
NEW BEDFORD MASS

HARRY F BARTHOLOMEW
SINCLAIR REFINING CO
133 COLLAMER ROAD
HILTON NEW YORK

EDWIN J BARTH
CHEM & LUB CONSULTANT
378 WEST END AV
NEW YORK 24 NEW YORK

RALPH F BARTH
ESSO STANDARD OIL CO
BOX 95
KENMORE NEW YORK

IVAN BARTIK
S F BOWSER CO LTD
344 SHERMAN AV N
HAMILTON ONT CANADA

THOMAS H BARTLETT
AM BRAKEBLOK DV AM BRA SHOE CO
P O BOX 21
BIRMINGHAM MICH

FREDERICK T BARWELL
OFF CHF ELEC ENG BRIT TRAN COM
222 MARYLEBONE ROAD
LONDON N W 1 ENGLAND

WM BARWORTH
PENNZOIL CO
217 VISTA DEL SOL
REDONDO BEACH CAL

JAS S BASSETT
UNION OIL CO OF CALIF
1201 CENTRAL AV
GREAT FALLS MONT

E L H BASTIAN
SHELL OIL COMPANY
50 WEST 50TH ST
NEW YORK 20 NEW YORK

GUY W BASSETT SR
PHILA BALL & ROLLER BEARING CO
253 57 WEST ERIE AV
PHILADELPHIA 40 PA

JAMES BATE
SHELL CO OF THAILAND LTD
NO 1 PAT PONG ROAD
BANGKOK THAILAND

MILTON F BATES
PATE DIV HUMBLE OIL & REF CO
4848 N CHRISTOPHER CT
BUTLER WIS

ERIC S BATES
BP N AMERICA LTD
630 FIFTH AV
NEW YORK 20 NEW YORK

JOHN L BATES
THE STANDARD OIL CO
1818 MIDLAND BUILDING
CLEVELAND 15 OHIO

NORMAN T BAUER
ACHESON COLLOIDS CO
510 N DEARBORN ST
CHICAGO 10 ILL

TROY P BAUGHMAN
LUBRIZOL CORPORATION
215 E RIDGEWOOD AV
RIDGEWOOD NEW JERSEY

HARRY J BAUMBACH JR
TIDEWATER OIL CO
1617 PENN BOULEVARD
PHILADELPHIA 3 PA

E W BAUMGARDNER
TRABON ENGINEERING CORP
28815 AURORA ROAD
SOLON OHIO

EDGAR BAXTER
CONTINENTAL OIL CO
836 STUART BLDG P O BOX 393
LINCOLN NEBRASKA

P M BEAIRD
CITIES SERVICE OIL CO
4125 43 AVENUE N
BIRMINGHAM 7 ALABAMA

FREDERICK M BEALL
SOCONY MOBIL OIL CO INC
24 YORKVIEW DR
TIMONIUM MARYLAND

JOHN L BEATTY
L R & J L BEATTY
919 E DARBY RD
HAVERTOWN PA

MARK L BEARDSLEE
GENERAL MOTORS CORP
17160 KENTFIELD
DETROIT 19 MICH

WILLIAM CLINTON BEASER
THE WHITMORE MFG CO
11550 MAPLERIDGE DR
NORTH ROYALTON 33 OHIO

H B BEATSON
IMPERIAL OIL CO LTD
CORN OF EDMONTON ST & BDWY AV
WINNIPEG 2 MANITOBA CANADA

GASTON BEAUCHAMP
MONTREAL TRANS COMM
8845 ST LAWRENCE BLVD
MONTREAL QUE CANADA

CLARENCE J BECK
BABCOCK & WILCOX CO
8071 NORTH 37TH ST
MILWAUKEE 9 WIS

RICHARD G BECK
STANDARD OIL CO
842 LEWIS
SUNNYVALE CAL

DEAN C BECKER
MIXING EQUIP CO
708 S GARFIELD ST
EAST ROCHESTER NEW YORK

R H BECKWITH
C H CLARK OIL CO
1579 WINCHESTER ROAD
LYNDHURST 24 OHIO

J M BEDE
2520 CEDAR AV
LONG BEACH 6 CAL

HENRY A BEDELL JR
BEL RAY CO INC
112 BROWN AV
SPRING LAKE NEW JERSEY

C R BEELER
TEXACO INCORPORATED
1210 WEST 28TH ST
KANSAS CITY 8 MISSOURI

WATSON G BEGGS
ALEMITE CO OF N CALIF
263 HUDSON ST
REDWOOD CITY CAL

HAROLD M BELDING
CENTRAL PETROLEUM CO
P O BOX 55
WOOSTER OHIO

ROBERT W BELFIT
68 SUNSET AV
WATERTOWN CONN

WILLIAM C BELFRY
TEXACO CANADA LIMITED
21 COMMISSIONERS ST
TORONTO ONT CANADA

BINDUMADHAV BELGAUMKAR
PROF & HEAD DEPT OF MECH ENGRG
INDIAN INSTITUTE OF TECH
KHARAGPUR WEST BENGAL INDIA

DAVID B BELL
152 EARL LANE
HATHORO PA

DOUGLAS BELL
AMPOL PETROLEUM LTD
BUCHANAN ST BALMAIN
SYDNEY AUSTRALIA

JAMES P BELL
LUBRICATION ENGINEERS INC
P O BOX 7128
FT WORTH TEXAS

JOHN R BELT
U S NAVAL ENGINEERING
EXPERIMENT STATION
ANNAPOLIS MARYLAND

ROBERT F BEMIS
SOCONY MOBIL OIL CO INC
9720 LITZSINGER ROAD
ST LOUIS 17 MISSOURI

HARVEY T BENOIT
HUGHES TOOL CO
P O BOX 2539
HOUSTON 1 TEXAS

HOWARD O BENNETT
AMERICAN OIL CO
910 SOUTH MICHIGAN AV
CHICAGO 80 ILL

PAUL A BENNETT
RES LABS GMC
882 PARLIAMENT
MADISON HEIGHTS MICH

W RONALD BENOLIEL
QUAKER CHEMICAL PRODUCTS CORP
CONSHOHOCKEN PA

JOSEPH B BENSKIN
LINCOLN ENGINEERING CO
4010 GOODFELLOW BLVD
ST LOUIS 20 MISSOURI

ARNOLD BENTSEN
KEYSTONE LUBRICATING CO
47 HILLTOP CIRCLE
LINCROFT NEW JERSEY

DR HELEN S BERETVAS
AMERICAN OIL CO
6832 SOUTH PAXTON AV
CHICAGO 49 ILL

EDGAR H BERG
ESSO STD OIL CO SLS ENGRG DIV
15 WEST 51ST ST
NEW YORK 19 NEW YORK

FRANK E BERGERON
JET LUBE INC
3093 N CALIFORNIA ST
BURBANK CAL

JAMES A BERGSTROM
WALKER MFG CO
1201 MICHIGAN BLVD
RACINE WIS

WM J BERNHART
W J BERNHART CO
2451 WEHRLE DRIVE
BUFFALO 21 NEW YORK

THOMAS A BESSENT
BETHLEHEM STEEL CO
1715 KENNOWAY RD
TOWSON 4 MARYLAND

WAYNE E BESSETTE
CARLISLE CHEMICAL WKS INC
1327 SOUTH HARLEM AV
BERWYN ILL

MORGAN CLARKE BIER
WHEELING STEEL CORP
STEELCRETE FACTORY
BEECHBOTTOM W VA

CURTIS L BIERLEY
MAGIE BROS OIL CO
4041 FIRESTONE AV
COLUMBIANA OHIO

C D BILLINGSLEY
ESSO STANDARD CO
209 NORTH AV
WASHINGTON PA

ARTHUR BIMM
NATL LOCK CO
1902 7TH ST
ROCKFORD ILL

KEITH H BIRKETT
BATTENFELD GREASE & OIL
8404 E 86TH TERR
RAYTOWN 33 MISSOURI

ALVIN A BIRNE
SWAN MICHIGAN OIL CO
473 SUMMIT ST
ENGLEWOOD CLIFFS N J

J WILEY BISCHOFF
TEXACO INC
3020 SOUTH RACE ST
DENVER 10 COLO

EDMUND E BISSON
NASA
20786 EASTWOOD AV
FAIRVIEW PARK OHIO

HAROLD C BISHOP JR
CONTINENTAL OIL CO
2705 IMPERIAL ST
SALT LAKE CITY 6 UTAH

RALPH M BISHOP
ROCHESTER GAS & ELEC CORP
69 EAST AV
ROCHESTER 4 NEW YORK

JOHN A BJORK
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER 5 MASS

JOHN L BJORK
STEWART WARNER CORP
1826 DIVERSEY PARKWAY
CHICAGO 14 ILL

RICHARD A BJORNDAL
STD OIL CO OF CALIF
225 BUSH ST ROOM 1055
SAN FRANCISCO CAL

ALEXANDER R BLACK
SHELL OIL COMPANY
50 WEST 50TH ST
NEW YORK 20 NEW YORK

ELLING HENRY BLACK
THE B F GOODRICH CO
485 EDGEWOOD AV
AKRON 7 OHIO

PAUL H BLACK
OHIO UNIVERSITY
DEPT OF MECH ENGR
ATHENS OHIO

D S BLACKMORE
CR THE BRITISH AMER OIL CO LTD
477 MT PLEASANT ROAD
TORONTO ONT CANADA

HARRY A BLACKSTONE
ASHLAND OIL & REF CO INC
ASHLAND KENTUCKY

RICHARD W BLAIR
CHICAGO RAWHIDE MFG CO
1301 ELSTON AV
CHICAGO 22 ILL

A J BLAKE
CITIES SERVICE OIL CO
19265 SKYLINE DR
ROSEVILLE MICH

FLOYD A BLAKE
SUNDSTRAND TURBO
2480 WEST 70TH
DENVER COLORADO

GILBERT D BLAKE
MOBIL OIL CO
9727 KESSLER
OVERLAND PARK KANSAS

TERANCE BLAKE
THE ATLANTIC REFINING CO
ATLANTIC BUILDING
SYRACUSE 2 NEW YORK

ROBERT M BLAKEY
THE STANDARD OIL CO OHIO
P O BOX 1070
STEUBENVILLE OHIO

R F BLEWETT
SUN OIL COMPANY
1608 WALNUT ST
PHILADELPHIA 3 PA

CHARLES F BLOCK
OWL OIL & SUPPLY CO INC
1506 1510 MANHATTAN AV
UNION CITY NEW JERSEY

HARMEN BLOK
RIJSWIK Z H
HAAWEG 192 HOLLAND

WILLIAM BLOKUIS
NEW SURPASS PETROCHEMICALS LTD
36 UPTON ROAD
SCARBOROUGH ONT CANADA

DR S BLOOMENTHAL
GENERAL TELEPHONE LABS INC
NORTHLAKE ILL

KEN BLOXHAM
CAN PRATT & WHITNEY AIRC CO LT
MFG DIV
LONQUEUIL QUE CANADA

WILLIAM A BLUM
PENNSALT CHEM COR TEC SERV DEP
900 1ST AV
KING OF PRUSSIA PA

M R BLURTON
ALEMITE CO OF SO CAL
333 W WASHINGTON ST
LOS ANGELES CAL

J MILLER BOAK
MONTREAL SERVICE & SALES
160 MONTIE DE LIESSE
MONTREAL 9 QUE CANADA

JOHN BOASE
LINCOLN ENGINEERING CO CANADA
411 BIRCHMOUNT ROAD
SCARBOROUGH ONT CANADA

NICULAE BOBOC JR
E F HOUGHTON & CO
8653 BRENTFORD RD
SAN GABRIEL CAL

MATTHEW A BOEHMER
WYANDOTTE CHEMICAL CO
RESEARCH & ENGRG DIV
WYANDOTTE MICH

LEONARD BOERS 111
SHELL OIL CO
1903 DURAND
SAGINAW MICHIGAN

DAVID J BOES
WESTINGHOUSE RES LAB
BEULAH RD CHURCHILL BORO
PITTSBURGH 35 PA

VICTOR H BOETTCHER JR
SHELL OIL CO
8130 CARPENTER FREEWAY
DALLAS TEXAS

PAUL C BOGART
TEXACO INCORPORATED
3300 E PRINCESS ANNE RD
NORFOLK VIRGINIA

SAMUEL N BOGGS JR
SINCLAIR REFINING CO
3657 MARTINSELL AV S W
ROANOKE VIRGINIA

GEORGE PAUL BOHNE
PENOLA OIL CO
28937 JOAN
ST CLAIR SHORES MICH

EDWARD L BOHN JR
MAPLE CITY PETROLEUM CO
P O BOX 383
NORWALK OHIO

OSWALD E BOLL
45 SEELFELDSTR
P O BOX ZURICH 32
ZURICH 8 SWITZERLAND

MICHAEL J BOLLMAN
GULF OIL CORP
528 WALNUT ST
HOLLIDAYSBURG PA

R O BOLT
CALIF RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

C J BONER
BATTENFELD GREASE & OIL CO
218 WEST 68TH TERRACE
KANSAS CITY 13 MISSOURI

STEPHEN BONIFAZI
PRATT & WHITNEY AIRCRAFT
BOX 10054
RIVIERA BEACH FLA

JOSEPH T BONNER
THE JOSEPH DIXON CRUCIBLE CO
167 WAYNE ST
JERSEY CITY NEW JERSEY

ALEXANDER D BONNINGTON
ASHLAND OIL & REFINING CO
731 BROADMOORE DR
SAN JOSE CAL

DUVERNEY C BOOK
GEN CHEM DIV ALLIED CHEM CORP
DELAWARE WORKS
NORTH CLAYMONT DELAWARE

DARRELL F BOONE
POLAROID CORP
R F D 1
NORFOLK MASS

E RICHARD BOOSER
GENERAL ELEC CO MEDIUM INDUCT
MOTOR LABS
SCHENECTADY 6 NEW YORK

WILLIAM J BOOTH
CITY OF OKLA CITY MUN GARAGE
2121 WESTWOOD BLVD
OKLAHOMA CITY 8 OKLA

ROBERT B BOOTHBY
LINCOLN ENGRG CO OF CAL
2844 S GRAND AV
LOS ANGELES 7 CAL

HOWARD E BOOZ
TEXACO INC
130 CLIFTON AV
SHARON HILL PA

KENNETH BORAH
SHELL OIL CO PROD APPL DEPT
50 WEST 50TH ST
NEW YORK 20 NEW YORK

SEBASTIAN BORDONARO
E I DU PONT DE NEMOURS
15 SHEINFINE AV
SOUTH RIVER NEW JERSEY

ARTHUR C BORG
AMERICAN OIL CO
P O BOX 431
WHITING IND

WM H BORNEMAN JR
THE LUBRIZOL CORP
29400 LAKELAND BLVD
CLEVELAND 17 OHIO

HOWARD W BOTTGER
CONTINENTAL OIL CO
P O BOX 795
OKLAHOMA CITY 1 OKLAHOMA

BERNARD BOUTET
HOWARD MARTEN & CO
124 MANVILLE
SCARBOROUGH ONT CANADA

CONSTANTINE F BOWBLIS
SHELL OIL CO
6268 BIG CREEK PARKWAY
PARMA HEIGHTS 30 OHIO

FRANK P BOWDEN
UNIVERSITY OF CAMBRIDGE
SUB DEPT OF THE CAVENDISH LAB
CAMBRIDGE ENGLAND

JOHN N BOWDEN
SOUTHWEST RES INSTITUTE
8500 CULEBRA ROAD
SAN ANTONIO TEXAS

WM BOWDEN
FIRESTONE TIRE & RUBBER
1945 11TH ST
CUYAHOGA FALLS OHIO

EDWARD K BOWEN
NAT SEAL DIVISION
BROADWAY AT NATL
REDWOOD CITY CAL

PAUL H BOWEN
WESTINGHOUSE ELEC CORP
1937 MELROSE AV
PENGLYN IRWIN PA

D E BOWERS
MOB OIL CO DIV SOC MOB OIL CO
RESEARCH DEPT PAULSBORO LAB
PAULSBORO NEW JERSEY

GEORGE F BOWERS
AMERICAN OIL CO
910 SOUTH MICHIGAN AV
CHICAGO 80 ILL

THOMAS J BOWES 111
CITIES SERV OIL CO BARCLAY BLD
CITY LINE & BELMONT AVES
BALA CYNWYD PA

GUTHRIE BOWLES
AMERICAN STANDARD
1541 SOUTH 7TH ST
LOUISVILLE KY

ARTHUR J BOYCE
REPUBLIC STEEL CORP
R D 3 BOX 28
CORTLAND OHIO

GEORGE R BOYD
INTERNATL BUSINESS MACHINES
218 SHEAFE ROAD
WAPPINGERS FALLS NEW YORK

JOHN BOYD
WESTINGHOUSE ELEC CORP RES LAB
BEULAH RD & CHURCHILL BORO
PITTSBURGH 35 PA

JOHN A BOYD
QUAKER CHEM PRODS CORP
319 WINDING WAY
MERION PA

PAUL C BOYD
CITIES SERVICE OIL CO
60 WALL ST
NEW YORK NEW YORK

WALTER B BOYLES JR
DOVER CHEMICAL CORP
928 VINESHIRE ROAD
CLEVELAND HEIGHTS 21 OHIO

ANDREW J BOZZELLI JR
SUN OIL COMPANY
MARCUS HOOK PA

ARTHUR D BRABBS
THE LUBRIZOL CORP
2736 E WALNUT ST
PASADENA CAL

NORMAN A BRACHT
ALAN WOOD STEEL CO
CONSHOHOCKEN PA

THOMAS P BRADFORD
HANNA COAL CO DIV CONS COAL
124 PARK DRIVE
ST CLAIRSVILLE OHIO

GUY D BRADLEY
GENERAL ELECTRIC CO
3001 E LAKE ROAD
ERIE PA

J E BRADLEY JR
PEERLESS OIL DISTRIBUTING CO
BOX 805
SALT LAKE CITY 10 UTAH

JOHN C BRADLEY
469 FARMINGTON AV
WATERBURY 10 CONN

JOHN E BRADLEY
LINCOLN ENGINEERING CO
4010 GOODFELLOW AV
ST LOUIS 2 MISSOURI

WM L BRADSHAW
TENN EASTMAN CORP
1446 VALLEY ST
KINGSPORT TENN

JAMES E BRADY
PENN PETROLEUM CORP
1470 S GULLEY ROAD
INKSTER MICH

ROSS K BRANDT
THE IRONSIDES CO
270 W MOUND ST
COLUMBUS 15 OHIO

HARRY A BRANNEN
LINCOLN ENGINEERING CO
6TH & ANNSBURY STS
PHILADELPHIA 40 PA

J L BRASSARD
METALCOTE GREASE & OIL
484 DRAKE
ST PAUL 2 MINNESOTA

ULRIC B BRAY
BRAY OIL CO
3344 MEDFORD ST
LOS ANGELES 63 CAL

JOHN R BREHMER
STEWART WARNER CORP
1826 DIVERSEY BOULEVARD
CHICAGO 14 ILL

PETER L BREINHOLD
LINCOLN ENGRG CO
2339 FAIRMONT AV
SANTA ANA CAL

EMIL G BRENDEL
HAMMERMILL PAPER CO
4810 CHERRY
ERIE PA

GEORGE W BRENHOLTS
NY & NJ LUBRICANT CO
13550 LORAIN AVE
CLEVELAND 11 OHIO

HARRY BROWN BRENIZER
SINCLAIR REFINING CO
2103 FOUNTAIN HILL DR
TIMONIUM MARYLAND

ELMER W BRENNAN
THE PURE OIL CO
CRYSTAL LAKE ILL

THOMAS L BRENNAN
GULF OIL CORPORATION
P O BOX 8056
PHILADELPHIA 1 PA

NEVIN T BRENNER
GULF RESEARCH & DEV CO
27 OXFORD ROAD
PITTSBURGH 2 PA

WILLIAM E BRETSCHNEIDER
THE WHITMORE MFG CO
1274 ROLAND
LYNDHURST 24 OHIO

A GORDON BREWER
SHELL OIL COMPANY
3 GATEWAY CENTER 15 E
PITTSBURGH 22 PA

ALLEN F BREWER
P O BOX 213
JENSEN BEACH FLORIDA

EDWARD S BREWER
BEMOL CORPORATION
131 STATE ST
BOSTON MASS

WILLARD M BREWER
DIAMOND ALKALI CO
143 NORTH DONN AV
PAINESVILLE OHIO

EMMETT V BRICELAND
CANADIAN KODAK CO LTD
EGLINTON AV W
TORONTO ONT CANADA

OTIS G BRIEDEN
EL PASO NATURAL GAS CO
P O BOX 1492
EL PASO TEXAS

JOHN A BRIGGS
DANLY MACHINE SPEC
341 DIVISION ST
MELROSE PARK ILL

GORDON S BRIGHT
TEXACO INC RES & TECH DEPT
P O BOX 1499
PORT ARTHUR TEXAS

JOHN G BRIGHT
SOCONY MOBIL OIL CO INC
RECTOR PA

LOREN E BRIGHTON
BETHLEHEM STEEL CO
161 HORNER ST
JOHNSTOWN PA

NEWTON E BRIGHTWELL
CHICAGO ROCK ISL & PAC R R
4701 S WENTWORTH
CHICAGO ILL

DONALD D BRILLHART
PRO CHEM INC
14713 ROCKSIDE RD
MAPLE HEIGHTS 37 OHIO

L E BRILL
WARCO GREASE & OIL LTD
2002 DUNDAS ST W
TORONTO 3 ONT CANADA

CLAUDE C BRITTAIN
SINCLAIR REFINING CO
5512 WEST 79TH ST
PRAIRIE VILLAGE 15 KANSAS

JOHN G BRITTAIN
STD OIL CO OF CAL
3581 YORKSHIRE RD
PASADENA 10 CAL

JIM BRIZZOLARA
ADA OIL CO
P O BOX 844
HOUSTON 1 TEXAS

GUS Z BROCKUS
DENS OIL LUBRICANT CO INC
1207 GRAND
KANSAS CITY 6 MISSOURI

HARRISON BROCKMEIER
CENTURY ELECTRIC CO
1806 PINE ST
ST LOUIS 3 MISSOURI

CHARLES M BROMLEY
S C JOHNSON & SON
840 EMERALD LANE
NAPERVILLE ILL

CHARLES E BROOME
GULF OIL CORP
713 WAYNE AV
READING PA

GILBERT K BROWER
INTERNATIONAL HARVESTER CO
4845 LEE ST
SKOKIE ILL

DOUGLAS A BROWN
THE BROOKS OIL CO
206 MAPLE AV
HAMILTON ONT CANADA

EDWARD C BROWN
IMPERIAL OIL LTD
150 LAIRD DRIVE
TORONTO 17 ONT CANADA

GLEN E BROWN
ALEMITE CO
6685 STEWART ROAD
CINCINNATI 36 OHIO

LEO L BROWN
UNION CARBIDE NUCLEAR CO
BUILDING 9739 BOX Y
OAK RIDGE TENN

PETER I BROWN
CALIFORNIA RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

WARREN G BROWN
CATERPILLAR TRACTOR CO
800 DAVIS ST
SAN LEANDRO CAL

WARREN G BROWN
KENNECOTT COPPER CORP
960 LORRAINE AV
SALT LAKE CITY UTAH

WM J BROWN
ORIENT GULF OIL CO
1414 DEWEY BLVD L & S BLDG
MANILA P I

AUBREY BROWNELL
BETHLEHEM STEEL CO
210 BUFFALO ST
HAMBURG NEW YORK

MAXWELL E BROWNELL
AMPOL PET LTD
BUCHANAN ST BALMAIN
SYDNEY N S W AUSTRALIA

ROY T BROWNING
DOW CORNING CORP
P O BOX 592
MIDLAND MICHIGAN

THOMAS MITCHELL BROYLES
INGERSOLL RAND
350 BRANNAN
SAN FRANCISCO CAL

GEORGE M BRUNDIGE
AMERICAN MACHINE & FDRY CO
420 EAST 5TH ST
BROOKLYN 18 NEW YORK

LAWRENCE C BRUNSTRUM
AMERICAN OIL CO
BOX 431
WHITING IND

HARRY B BRUSH
QUAKER CHEMICAL PROD
1169 LAKEMONT DR
PITTSBURGH 16 PA

ALLEN E BRYSON
THE ATLANTIC REFINING COMPANY
3144 PASSYUNK AV
PHILADELPHIA 1 PA

DONALD H BUCKLEY
NASA
18805 ELSMERE
CLEVELAND OHIO

ARTHUR M BUECHE
GENERAL ELECTRIC RES LAB
P O BOX 1088
SCHENECTADY NEW YORK

KENT R BULFINCH
SHELL OIL CO
100 BUSH ST
SAN FRANCISCO CAL

KEMP R BUNTING
AMERICAN OIL CO
2500 NEW YORK AV
WHITING IND

STARLING S BURGESS
SOCONY MOBIL OIL CO INC
132 LEXINGTON AV
BUFFALO 9 NEW YORK

LUCIEN S BURKE
STANDARD OIL CO
830 OAKCREEK DRIVE
DAYTON 59 OHIO

VINCENT F BURKE
SHELL OIL CO
55 PUBLIC SQUARE
CLEVELAND OHIO

TOM E BURKE
CITIES SERVICE OIL CO
20 NORTH WACKER DR
CHICAGO 6 ILL

JAMES E BURLEIGH
ROCHESTER GAS & ELEC CORP
54 CAMBRIA ROAD
ROCHESTER NEW YORK

G R BURNHAM
GULF OIL CORP
BOYNTON ST
PEPPERELL MASS

GEORGE R BURNS
SUN OIL COMPANY LTD
85 BLOOR ST E
TORONTO ONT CANADA

THOMAS E BURNS
HUNTINGTON ALLOY PROD DIV
INTERNATIONAL NICKEL CO
HUNTINGTON WEST VIRGINIA

RICHARD D BUSSARD
LADISH CO
5481 S PACKARD
CUDAHY WIS

THOMAS A BUTLER
LUBRIZOL CORP
29400 LAKELAND
WICKLIFFE OHIO

G STANLEY BUTMAN
WARREN REF & CHEM CO
35 EUCLID AV
QUINCY 69 MASS

DEWEY R BUTT
CANFIELD OIL CO
7720 WEST CHICAGO
DETROIT 4 MICH

DEWEY R BUTT
CANFIELD OIL CO
7720 WEST CHICAGO
DETROIT 4 MICH

TAYLOR B BUTTLES
13975 S W BEND ROAD
TIGARD OREGON

LLOYD M BUNTING
TIDEWATER OIL CO
BOX 1576
RICHMOND VIRGINIA

TRAIAN CABBA
BP CANADA LIMITED
550 SHERBROOKE ST W
MONTREAL 2 QUE CANADA

W ELLSWORTH CADELL
LINCOLN ENGRG CO
203 HILTON AV
CATONSVILLE 28 MARYLAND

THOMAS H CAFCAS
AMOCO CHEMS CORP
812 BRAEMAR ROAD
FLOSSMOOR ILL

E S CAIN
AIRESEARCH MFG CO OF ARIZONA
402 SOUTH 36TH ST
PHOENIX ARIZONA

G A CAIRNS
MACCO PRODUCTS CO
9210 S SANGAMON
CHICAGO 20 ILL

SYDNEY R CALISH JR
CALIF RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

R G CALL
AMER ELEC POWER SERV CORP
P O BOX 565
HUNTINGTON WEST VIRGINIA

FRANCIS J CALLAHAN JR
KENMORE RESEARCH CORP
64 MAPLE ST
CHAGRIN FALLS OHIO

JOSEPH A CALLEO
CALIFORNIA OIL CO
440 EAST MAIN ST
ROCHESTER 4 NEW YORK

RAYMOND CAMIRE
MASSEY FERGUSON LTD
915 KING ST W
TORONTO 3 ONT CANADA

EDWIN W CAMPBELL
GULF OIL CORPORATION
P O BOX 2140
HOUSTON 1 TEXAS

JOHN B CAMPBELL
UNION OIL CO
6800 EAST NILES ST
BAKERSFIELD CAL

DR W E CAMPBELL
2745 EDGEHILL ROAD
CLEVELAND HEIGHTS 6 OHIO

WM C CAMPBELL JR
JOHNS MANVILLE SALES CORP
CHESTNUT ST AT 4TH HALL BLDG
PHILADELPHIA 6 PA

WAYNE E CANFIELD
PENOLA OIL CO
1717 LINDEN AV
DEARBORN MICH

JOSE R CANAL
WYMAN GORDON CO
257 BRIGHAM HILL RD
NORTH GRAFTON MASS

HAROLD L CANNELL
STD OIL CO OHIO
26518 KICKERBACKER RD
BAY VILLAGE OHIO

WILLIAM D CANNING
UNION OIL CO
7903 COZYCROFT
CANOGA PARK CAL

GORDON CAPEL
MASSEY HARRIS FERGUSON
52 DRAYCOTT DRIVE
TORONTO 16 ONT CANADA

LEIGH R CAPSHAW
ESSO STD DV HUM OIL & REF CO
5402 STUDELEY AV
NORFOLK VIRGINIA

DONALD B CAPWELL
ESSO STANDARD OIL CO
P O BOX 95
KENMORE 17 NEW YORK

CHARLES R CARBUTT JR
SUN OIL CO
51 WINTER PARK ROAD
FRAMINGHAM MASS

SALVATORE CARDELLA
AMER RADIATOR & STD SAN CORP
87 RANO ST
BUFFALO 7 NEW YORK

EDWARD CARMAN
CALUMET REFINING CO
13921 MACKINAW AV
CHICAGO 33 ILL

DOUGLAS L CARLSON
FILMITE OIL CORP
12735 W CORTEZ DR
HALES HGTS HALES CORNERS WIS

EINAR A CARLSON
W A WOOD CO
108 SPRING ST
EVERETT 49 MASS

E S CARMICHAEL
SOCONY MOBIL OIL CO INC
412 GREENPOINT AV
BROOKLYN 22 NEW YORK

B H CARPENTER
SINCLAIR REFINING CO
600 FIFTH AV
NEW YORK NEW YORK

MAJ A E CARPENTER
E F HOUGHTON & CO
303 W LEHIGH AV
PHILADELPHIA 33 PA

WILLIAM C CARR
BROOKS OIL CO
928 RIDGE AV
PITTSBURGH 12 PA

FRED W CARRIER
GOODYEAR ATOMIC CORP
654 CEDAR ST
CHILLICOTHE OHIO

JAMES G CARROLL
CALIF RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

JOSEPH H CARROLL
PREMIER FASTENER CO
1140 ASHLAND AV
DETROIT 15 MICH

JOEL L CARSON
CHAMPION OIL & REFINING CO
BOX 552
ENID OKLAHOMA

CRAWFORD F CARTER
CALIF RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

LINDSAY P CARTER
PRODUCTION SUPPLY CO
1394 WILLIAM ST
VANCOUVER 6 B C CANADA

M K CARTER
UNION OIL CO
2151 LOMA VISTA
PASADENA 7 CAL

M L CARTER
SOUTHWEST GREASE & OIL CO INC
220 W WATERMAN
WICHITA 2 KANSAS

WILLIAM L CARTER
ALDRIDGE INDUSTRIAL OILS
3401 WEST 140TH
CLEVELAND 11 OHIO

E R BILL CARTMILL
PHILLIPS PETROLEUM CO
4546 EAST 8TH ST
TULSA OKLA

GERARD P CARUSO
LONG BEACH NAVAL SHIPYARD
3709 DUMAINE ST
NEW ORLEANS 12 LA

JOHN B CARVER
COOPER BESSEMER CORP
116 EAST GAMBIER ST
MT VERNON OHIO

KENNETH J CARVER
HAYNES STELLITE CO
718 S INDIANA AV
KOKOMO INDIANA

CHARLES CASALEGGI
PUROLATOR PRODUCTS INC
070 NEW BRUNSWICK AV
RAHWAY NEW JERSEY

CARL S CASELLA
SMITH WEINMAN CO INC
P O BOX 391
SOMERVILLE NEW JERSEY

WALTER W CASEY
RICHFIELD OIL CORP
3309 S W FALCON ST
PORTLAND 19 OREGON

WILLIAM F CASHIN
MINN HONEYWELL REGULATOR CO
2753 4TH AV S
MINNEAPOLIS MINNESOTA

KENNETH CASHMORE
THE BRITISH AMER OIL CO LTD
193 ELTON PARK ROAD
OAKVILLE ONT CANADA

WILLIAM CASSANOS
HALOCARBON PROD CORP
82 BURLEWS COURT
HACKENSACK NEW JERSEY

R G CASSIDY
FILMITE OIL CORP
12733 W ARDEN PLACE
BUTLER WIS

GEORGE K CASTLE
SHELL OIL CO
3RD & ARMY ST
SAN FRANCISCO CAL

JAMES G CASTLES
INGENIERO TECNICO IND
APARTADO AEREO NO 3327
MEDELLIN COLOMBIA S A

FRANK J CAWRSE
E F HOUGHTON & CO
15613 NORMANDY AV
CLEVELAND 11 OHIO

ANTHONY B CELI
GENERAL ELECTRIC CORP
229 CONANT ST
DANVERS MASS

MARTHINUS JACOBUS CERFF
CALTEX AFRICA LTD
SHINGLEWOOD 7 KESWICK WAY
PINELANDA CAPE SOUTH AFRICA

DONALD J CHALEKI
MORGAN CONSTRUCTION CO
15 BELMONT
WORCESTER 5 MASS

HAROLD CHALK
ETHYL CORPORATION
1600 W 8 MILE RD
DETROIT 20 MICH

ROY E CHAMBERLAIN
WESTERN OIL & FUEL CO
227 COLFAX AV N
MINNEAPOLIS 5 MINNESOTA

FRANCIS E CHAMBERLIN
CALIF RES CORP
327 30TH ST
MANHATTAN BEACH CAL

DEXTER W CHAMBERS
CENTRAL PETROLEUM CO
548 STANDARD BLDG
CLEVELAND OHIO

ORA W CHANDLER
MOB OIL CO DV SOC OIL CO INC
P O BOX 900
DALLAS 21 TEXAS

CHARLES R CHAPLIN
STD OIL CO OHIO
1135 WARDER ST
SPRINGFIELD OHIO

FRANK S CHAPLIN
INDEPENDENT CONSULTING ENGR
JOHNSON ROAD R D 4
NORRISTOWN PA

EDWARD L CHAPMAN
CR DIAMOND ALKALI CO
ENGINE ROOM DEPT P O BOX 430
PAINESVILLE OHIO

PAUL R CHAPMAN
THE PURE OIL CO
200 RIDGE AV
CRYSTAL LAKE ILL

PAUL F CHAPPELL
2 CROSS RIDGE ROAD
HAVEMEYER PARK
OLD GREENWICH CONN

SAMUEL E CHARLTON
HUMBLE OIL & REFINING CO
200 SOUTH MICHIGAN AV
CHICAGO 4 ILL

SPENCER CHASE
JOS DIXON CRUCIBLE CO
1140 ALFINI DRIVE
DES PLAINES ILLINOIS

R M CHERRYHOLMES
FED ELEC CORP DV INTL TEL & TT
129 WOODFIELD ROAD
WESTWOOD NEW JERSEY

CLIFTON A CHILSON
NEWPT NEWS SHIP & DRYDOCK CO
31 TURNER TERR
WARWICK VIRGINIA

THOMAS W CHISHOLM
PARK CHEMICAL
8074 MILITARY
DETROIT 4 MICH

HERBERT E CISSLEY
E I DU PONTDE NEMOURS
1114 CLEVELAND HEIGHTS BLVD
CLEVELAND HEIGHTS 21 OHIO

GEORGE F CHMELIK
WESTERN ELECTRIC INC
HAWTHORNE WORKS
CHICAGO ILL

FREDERICK A CHRISTIANSEN
CR CALIFORNIA RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

ANDREW E CICHELLI
BETHLEHEM STEEL CO
EAST THIRD ST
BETHLEHEM PA

ANTHONY J DE CILLIS
CONTINENTAL OIL CO
400 W MADISON ST ROOM 800
CHICAGO 6 ILL

A M CLAPP
TEXAS DIV THE DOW CHEM CO
416 CENTER WAY
LAKE JACKSON TEXAS

ELMO R CLARK
COL GENEVA STEEL CO
710 SOUTH 5TH WEST
PROVO UTAH

GORDON J CLARK CHIEF CHEMIST
THE FAFNIR BEARING CO
NEW BRITAIN CONN

J A CLARK
STANDARD OIL CO
1859 WOODFILL WAY
LOUISVILLE 8 KY

PERRY A CLARK
TEXACO INC
240 VIA EBOIL
NEWPORT BEACH CAL

PETER C CLARK
PENOLA OIL CO
21701 S MILITARY
DEARBORN MICH

RALPH W CLARK
E I DU PONT DE NEMOURS CO INC
WILMINGTON 98 DELAWARE

THOMAS P CLARKE
CITIES SERVICE OIL CO
6407 VERMONT
GARY IND

CHARLES G CLEAR
SHELL DEVELOPMENT CO
4560 HORTON ST
EMERYVILLE CAL

DEAN M CLEAVELAND
BENDIX PROD DIV BEND AVN CORP
401 N BENDIX DR
SOUTH BEND 20 IND

ALWYNNE E CLEMMER
GULF OIL CORPORATION
P O BOX 5000
PITTSBURGH 6 PA

J ROBERT CLENDENNING
E F HOUGHTON & CO
463 CONSHOHOCKEN STATE RD
BALA CYNWYD PA

DONALD R CLERE
SUN OIL CO
BOX 26
KENOVA WEST VIRGINIA

KENNETH GLEN CLONINGER
SHELL OIL CO
100 THOMPSON BOX 7223
RICHMOND VIRGINIA

N BLAIR COCHRANE
N B COCHRANE COMPANY
344 EAST 33RD ST
BALTIMORE 18 MARYLAND

MICHAEL H COCKS
FORD MOTOR CO
3425 WILLOW
DEARBORN MICH

WILLIAM F CODY
2513 ARGYLE
CHICAGO 25 ILL

LOUIS F COFFIN JR
GENERAL ELECTRIC CO
1178 LOWELL ROAD
SCHENECTADY 8 NEW YORK

HOLT EMMETT COGGIN
GEORGIA CAROLINA OIL CO
1403 SIXTH ST BOX 101
MACON GEORGIA

HERBERT J COHEN
NORTHERN ELECTRIC CO
150 METROPOLITAN BLVD
LACHINE QUE CANADA

ROBERT M COKINDA
SHELL OIL COMPANY
41 70 MAIN ST
FLUSHING 55 L I NEW YORK

EDWARD F COLBURN
CROCKER BURBANK PAPER CO INC
545 WESTMINSTER
FITCHBURG 4 MASS

DONALD C COLBY
TEXACO INC
11121 SOUTH GREEN
CHICAGO 43 ILL

LOUIS H COLE JR
UNION OIL CO OF CAL
4740 HAMPTON RD
LA CANADA CAL

EDWIN J COLERICK
SHELL OIL COMPANY INC
50 WEST 50TH ST
NEW YORK 20 NEW YORK

GUSTAV T COLLATZ
THE G T COLLATZ CO
473 WASHINGTON ST
WELLESLEY BOSTON 81 MASS

ALBERT H COLLIER
COLT WORTHINGTON OIL WKS INC
DICKENS ST
WESTBURY L I NEW YORK

GLENN A COLLINS JR
TELEFLEX INC
701 EAST WALNUT ST
NORTH WALES PA

JAMES M COLLINS
SHELL OIL CO
ROUTE 1 GRAMLICH ROAD
LA VALE MARYLAND

J FORREST COLLINS JR
TEXACO INCORPORATED
BOX 1722
ATLANTA GEORGIA

MAURICE W COLLINS JR
ESSO STANDARD OIL CO
4221 BARNETT
PHILADELPHIA 35 PA

ROBERT E COLLITON
THE STANDARD OIL CO OHIO
267 NAPOLEON AV
COLUMBUS 13 OHIO

JOSEPH G COLTON
FISKE BROS REFINING CO
33 HALL DRIVE CLARK TOWNSHIP
RAHWAY NEW JERSEY

GUIDO J COLUCCI
E F HOUGHTON & CO
913 MARYLN ROAD
PHILADELPHIA 31 PA

ROBERT J COLVIN
OAKITE PRODUCTS INC
112 BRADFORD LANE
SYRACUSE NEW YORK

ANTHONY COMPARE
SHELL OIL CO OF CANADA LTD
1255 UNIVERSITY ST
MONTREAL QUE CANADA

VAUGHN W COMSTOCK
THE TORRINGTON CO
EAST ST
GOSHEN CONN

JAMES DAVID CONBOY
AERONAUTICAL ENGINF LAB
430 WARREN BOULEVARD
BROOMALL PA

W CHAPIN CONDIT
SUN OIL CO
472 SOUTH SALINA ST
SYRACUSE 2 NEW YORK

JOHN ROBERT CONDON JR
COMMERCIAL FILTERS CORP
14327 SOUTH KIMBARK AV
DOLTON ILL

EDWARD C CONNELL
GULF OIL CORP
404 WINONA BLVD
ROCHESTER 17 NEW YORK

KENNETH T CONNELL
SHELL OIL CO
3470 CAMELLIA DR
SAN BERNARDINO CAL

ROBERT F CONNELLY
BRAY OIL CO
3344 MEDFORD ST
LOS ANGELES 63 CAL

GORDON M CONNER
CANADIAN OIL COS LTD
24 HUDSON DRIVE
TORONTO ONT CANADA

JAMES F CONNER
CITIES SERVICE OIL CO
1320 MACKLIND AV
ST LOUIS 10 MISSOURI

VAUGH E CONNOLLY
UNION OIL CO
2520 W GREENBRIER LANE
LA HABRA CAL

H J CONNORS JR
WESTINGHSE ELE CP WEST RES LAB
CHURCHILL BORO
PITTSBURGH 35 PA

DONALD M CONROY
ACHESON COLLOIDS CO
12429 CEDAR ROAD
CLEVELAND OHIO

THOMAS J CONROY
GRUMMAN AIRCRAFT ENG CORP
76 JUNIPER ROAD
PORT WASHINGTON NEW YORK

HAROLD M CONVERSE
CENTRAL PETROLEUM CO
31 VALLEY VIEW DRIVE
PENFIELD NEW YORK

GEORGE R COOK
THE PURE OIL CO
220 SOUTH REUTER DR
ARLINGTON HEIGHTS ILL

JAMES F COOK
UNION OIL CO OF CAL
P O BOX 76
BREA CAL

RANDOLPH C COOK
MOBIL OIL CO
7603 HAMPSHIRE ROAD
RICHMOND 29 VIRGINIA

WELDON C COOK
THE AIR PREHEATER CORP
SOUTH MAIN ST
WELLSVILLE NEW YORK

EVERETT K COOPER JR
ESSO STD DIV HUM OIL & REF CO
P O BOX 93
MECHANICSBURG PA

WILFRED JOHN COOPER
BRITISH AMERICAN OIL CO LTD
800 BAY ST
TORONTO ONT CANADA

WILLIAM N COOPER
YOUNGSTOWN SHEET & TUBE
3324 GLEN OAKS
YOUNGSTOWN 11 OHIO

ROBERT W CORBOY
ALEMITE CO PITTSBURGH
2945 CHARTIERS AV
PITTSBURGH 4 PA

EUGENE PATRICK CORCORAN
THOMAS EQUIPMENT INC
3181 LINWOOD ROAD
CINCINNATI 8 OHIO

FRED CORDNER
BRAY OIL CO
3344 MEDFORD ST
LOS ANGELES 63 CAL

BRIAN CORRIGAN
TEXACO INCORPORATED
3521 EAST MICHIGAN ST
INDIANAPOLIS 1 INDIANA

JOE CORTE JR
ADA OIL CO
5927 MOONMIST DR
HOUSTON 36 TEXAS

SALVATORE G COSCIA
KELSEY HAYES HEINTZ DIV
FRONT & OLNEY STS
PHILADELPHIA PA

STANLEY L COSGROVE
CBS LABORATORIES
HIGH RIDGE ROAD
STAMFORD CONN

ERMAL G COSMAN
COOPERATIVE FARM CHEM ASSOC
P O BOX 80
LAWRENCE KANS

PAUL L COSPER
MICHIGAN MFGRS SERVICE INC
16550 GREENFIELD
DETROIT 35 MICH

THOMAS R COSTELLO
THE MARK COSTELLO CO
1417 GEORGIA ST
LOS ANGELES 15 CAL

RENE COTE
201 DE L EGLISE
P O BOX 125
DONNACONA QUE CANADA

ROBERT H COTTRELL
SHEFFIELD STEEL
7600 ROBERTS
KANSAS CITY MISSOURI

RALPH L COUCH
CENTRAL PETROLEUM CO
548 STANDARD BUILDING
CLEVELAND 13 OHIO

ROBERT COURTEL
INSTITUT FRANCAIS DE PETROLE
2 RUE DE LUBECK
PARIS 16 FRANCE

WILLIAM F COUSER
CELANESE CHEMICAL CO
6050 WEST TOUHY
CHICAGO ILL

N S COVACEVICH
COMMERCIAL EUZKADI S A
LAGO ALBERTO 418
MEXICO 17 D F MEXICO

JOHN H COVERDALE
CONTINENTAL OIL CO
BOX 2250
SALT LAKE CITY 10 UTAH

CHARLES P COVINO
GENERAL MAGNAPLATE CORP
331 MAIN ST
BELLEVILLE NEW JERSEY

M J COWAN
JOHNS MANVILLE SALES CORP
P O BOX 3216
YOUNGSTOWN 12 OHIO

DON JAMES COWARD
IMPERIAL OIL LTD
1061 DON MILLS ROAD
DON MILLS ONT CANADA

JAMES B COWDEN
COL GEN STEEL DV US STEEL CP
185 CAMINO POSADA
WALNUT CREEK CAL

ALLEN M COX
CITIES SERVICE OIL CO OF PA
P O BOX 1261
CAMDEN NEW JERSEY

BRUCE W COX
REPUBLIC STEEL CORP
OBERLIN ROAD
MASSILLON OHIO

CLARENCE R COX
TITANIUM METALS CORP
BOX 718
TORONTO OHIO

MONTA O COX
COX ENGINEERING & SALES
3020 E CANFIELD
DETROIT 7 MICH

FELIX T H CRABBE
AVENUE DE TERVUEREN 296C
BRUXELLES 15 BELGIUM

W D CRAIG JR
GRUMMAN AIRCRAFT ENGR CORP
BETHPAGE LONG ISLAND NY

W H CRAIG
SHARPLES CORPORATION
ROOM 712 80 E JACKSON BLVD
CHICAGO 4 ILL

WILLIAM D CRAM
UNITED SHOE MACHINERY CORP
BALCH ST
BEVERLY MASS

EDWIN CRANKSHAW
CLEVELAND GRAPHITE BRONZE
17000 ST CLAIR ST
CLEVELAND 10 OHIO

JOHN H CRANKSHAW
DYNETICS INC
439 SHAWANEE DRIVE
ERIE PA

RUSSELL H CRAWFORD
GULF OIL CORP
330 STATE ROAD
DEVON PA

ROBERT E CREAN
LINCOLN ENGINEERING CO
4010 GOODFELLOW BLVD
ST LOUIS 20 MISSOURI

DAHL P CREED
TEXACO INC
2528 VOLNEY ROAD
YOUNGSTOWN OHIO

GLEN B CRIDER
GARRET CO AIRSEARCH IND
19800 ACRE ST
NORTHRIDGE CAL

JOHN P CRITCHLOW
GULF EASTERN CO GULF HOUSE
2 PORTMAN ST
LONDON W 1 ENGLAND

A M CRITTENDEN
MOHAWK REFINING CORP
156 CLINTON PLACE
HACKENSACK NEW JERSEY

ARTHUR G CROCKER
UNION OIL CO OF CAL
P O BOX 277
RIALTO CAL

PETER V CROFT
PENNSYLVANIA REFINING CO
2686 LISBON ROAD
CLEVELAND 4 OHIO

FREDERICK K CROOKSHANK JR
GULF RES & DEV CO REF TECH LAB
P O BOX 7409
PHILADELPHIA 1 PA

ALBERT L CROSBIE
THE BRITISH AMER OIL CO LTD
650 BURLING ST EAST
HAMILTON ONT CANADA

C H CROWE
CANADIAN GENERAL ELEC CO
PARK ST
PETERSBOROUGH ONT CANADA

EDWARD J CROWLEY
ALOX CORP
561 FIFTH AV
RIVER EDGE NEW JERSEY

R J CUFF
CYCLEWELD DIV CHRYSLER CORP
5333 COMBOURNE PLACE
BIRMINGHAM MICH

ROBERT C CUFFEL
STD OIL CO OF CALIFORNIA
P O BOX 220
SEATTLE WASHINGTON

MERRITT J CULVER
DANLY MACHINE SPEC INC
87 NORTH DELAPLAINE
RIVERSIDE ILL

WILLIAM P CULVER
THE STD OIL CO OHIO
5052 WHEATON ST
DAYTON 59 OHIO

SAMUEL A CUMMINS
LANCO ENGINEERING SALES CO
33RD & ARCH STS
PHILADELPHIA 4 PA

E P CUNNINGHAM
MONSANTO CHEMICAL COMPANY
800 NORTH LINDBERG
ST LOUIS 66 MISSOURI

JAMES T CUNNINGHAM
GULF OIL CORP
246 BUCKLEY ROAD
LIVERPOOL NEW YORK

RICHARD G CUNNINGHAM
SHELL OIL MFG RES DEPT
50 WEST 50TH ST
NEW YORK 20 NEW YORK

ROBERT A CUPPER
TECH SERV LAB UN CARB CHEM CO
P O BOX 65
TARRYTOWN NEW YORK

IRA L CUPPLES
CITIES SERVICE OIL CO
5107 LAKEVIEW ROAD
NORTH LITTLE ROCK ARKANSAS

SULLIVAN DANIEL CURRAN
HUMBLE OIL & REFINING CO
1106 KEEFER ROAD
GIRARD OHIO

JOHN F CUSACK
FISKE BROS REFINING CO
35 ALBANY ROAD
AVON BY THE SEA NEW JERSEY

WILLIAM J CUSHING
TIMKEN ROLLER BEARING CO
2180 NOBLESTOWN ROAD
PITTSBURGH 5 PA

E MALCOLM CUTLER
THE FORD MOTOR CO
3001 MILLER ROAD
DEARBORN MICH

JAMES L CUTLER
HAMILTON STD DIV BRADLEY FLD
1467 SUFFIELD ST
SUFFIELD CONN

RALPH E CYRUS
NEWPT NEWS SHIP & DRYDOCK CO
804 RIVER ROAD
NEWPORT NEWS VA

ARTHUR W DAHL
AMCHEM PRODUCTS INC
AMBLER PA

PHILIP T DAILEY
MIDWEST SUPPLY CO
1134 BIG FALLS AV
AKRON 10 OHIO

G W DANDRIDGE
MINE ELECT LTD
48 CALENBRANDER AV
NO END BULAWAYO SOUTH RHODESIA

PIERRE DANEL
SOC GRENO DE TUDES ET DAPPL HY
SOGREAH BOITE POST 52
GRENOBLE FRANCE

ALBERT EARL DANIELS ONTARIO LU
BRICATING CO LTD
R R 3
DUNDAS ONT CANADA

CLOYCE R DANIELS
HUMBLE OIL & REF CO MANUF DIV
34TH & SMALLMAN STS
PITTSBURGH 1 PA

K A DANSKIN
CR LUBRIZOL CORP
P O BOX 3057
CLEVELAND 17 OHIO

KENNETH J DARTLEY
CELANESE CHEMICAL CO
1105 PRUDENTIAL BLDG
HOUSTON 25 TEXAS

CHARLES A DAUGHERTY
COL GENEVA DIV U S STEEL CORP
840 BORDER AV
TORRANCE CAL

DONALD A DAVIDSON
TENNESSEE EASTMAN CO
201 WARRIOR DR
KINGSPORT TENN

EARL FREDERICK DAVIES
N AMERICAN AVIATION
13520 SOUTH CASIMIR
GARDENA CAL

GEORGE C DAVIES
SOCONY MOBIL OIL CO
667 CRAIG WOODS DRIVE
KIRKWOOD 22 MISSOURI

GEORGE H DAVIS
SHELL OIL CO
50 WEST 50TH ST
NEW YORK 20 NEW YORK

HUGH L DAVIS
RES APPLIANCE CO
129 SYCAMORE ST
PITTSBURGH 11 PA

JAMES B DAVIS
MONSANTO CHEMICAL CO
1700 SOUTH 2ND ST
ST LOUIS 77 MISSOURI

KENNETH L DAVIS
LUBRICATION ENGINEERS INC
122 CARPENTER AVE
MERIDEN CONNECTICUT

RICHARD DAVIS
MONSANTO CHEMICAL CO
800 N LINDBERG BLVD
ST LOUIS 66 MISSOURI

ROY B DAVIS
ALEMITE CO OF OHIO VALLEY
3320 CORNELIA DR
LOUISVILLE 5 KY

HAROLD J DAWE
ACHESON INDUSTRIES INC
P O BOX 8
PORT HURON MICH

JAMES C DAWSON
PATE DIV HUMBLE OIL & REF CO
2847 NORTH 83RD ST
MILWAUKEE 10 WIS

KENNETH H DAY
LUBRICATION ENGINEERS INC
2807 RACE ST
FORT WORTH TEXAS

WESLEY H DAY
SHELL OIL CO INC
624 SOUTH MICHIGAN AV
CHICAGO 5 ILL

H B DEAKINS
GULF OIL CORP
11405 CLEMATIS BOULEVARD
PITTSBURGH 35 PA

KENNETH J DEAN
SHELL OIL CO OF CANADA LTD
505 UNIVERSITY AV
TORONTO ONT CANADA

THOMAS N DEANE
BRAY LUBRICANTS CO
754 SPRUCE ST
BERKELEY CAL

ANTHONY J DE ARDO
ALUMINUM CO OF AMER RES LABS
BOX 772
NEW KENSINGTON PA

H B DEBENEDETTI
TIDEWATER OIL CO
MARTINEZ CAL

OTTO DECKER
THOM RAMO WOOL INC NEW DEV LAB
7209 PLATT AV
CLEVELAND 4 OHIO

CARLOS F DE CARDONS
ESSO STANDARD OIL CO PR
P O BOX 2151
PONCE PUERTO RICO

ROBERT E DE CELLES
PURE OIL CO
1090 VIRGINIA ST
GARY IND

JOSEPH D DEFREITAS
PETROLEUM MARKETING AGENCIES
29 HOLMES & MAIN STS
BRITISH GUIANA SOUTH AMERICA

WILLIAM ALEX DEHMER JR
WAGNER ELECTRIC CORP
6400 PLYMOUTH ST
ST LOUIS 14 MISSOURI

SIGMUND S DELUGA
AMERICAN OIL CO
2500 NEW YORK AV
WHITING IND

DAVID E DE LORY
SUN OIL CO
35 855 TIMERLANE DR
SOLON 31 OHIO

WILLIAM B DEMBNER
THE BROOKS OIL CO
248 ROBINA ROAD SS 2
ANCASTER ONT CANADA

ROBERT P DEMPLER
GEO P DEMPLER CO
1610 POTOMAC DR
PITTSBURGH 16 PA

E C DENNE JR
SKF INDUSTRIES INC
FRONT & ERIE AV
PHILADELPHIA 32 PA

ARTHUR C DENNINGTON
CENTRAL PETROLEUM CO
WALCOTT IOWA

R DEPELSENAIRE
LABS DE RECHERCHES PURFINA S A
100 CHAUSSEE DE VELVORDE
BRUSSEL BELGIUM

ROBERT J DERBER
FAIRBANKS MORSE & CO
BELOIT WISCONSIN

W J DERKSEN
THE PURE OIL CO
P O BOX 156
BIRMINGHAM ALABAMA

WILLIAM JOHN DERNER
CURTISS WRIGHT CORP
363 MONROE AV
WYCKOFF NEW JERSEY

L J DERRICK JR
GULF OIL CORP
P O BOX 327
CINCINNATI 1 OHIO

PHILIP DE VEAU
ABRASIVE SPECIALISTS OF WIS
3445 W FOREST HOME AV
MILWAUKEE 15 WIS

HUBERT J DEVER
ALEMITE CO OF EAST PA
704 N 16TH ST
PHILADELPHIA 30 PA

G S DEVONSHIRE
TEXACO CANADA LTD
44 HAILEYBURY DRIVE
SCARBORO ONT CANADA

C J DEVRIES
SEXTON & PEAKE INC
1025 CONN AV N W
WASHINGTON 6 D C

LEO V DEWAR
SOCONY MOBIL OIL CO
297 CASTLEBAR RD
ROCHESTER 10 NEW YORK

NORMAN B DEWEES
WESTINGHOUSE ELEC CORP
1296 ARROWOOD DR
PITTSBURGH 16 PA

H M DICKINSON
FISKE BROS REFINING
129 LOCKWOOD ST
NEWARK NEW JERSEY

JOHN M DIDDEN SR
LUBRICATION ENGINEERS INC
R F D 1 BOX 52
REDFIELD NEW YORK

FREDERICK M DIELMAN
FARGO OIL & GREASE CO
ROUTE 13 BOX 213
FORT WORTH TEXAS

PAUL W DIETZEL
STANDARD OIL CO OHIO
3622 SHELBY ROAD
YOUNGSTOWN 11 OHIO

EDGAR A DILL
EASTMAN KODAK
73 SHARON DRIVE
ROCHESTER 15 NEW YORK

H TED DINKELKAMP
ALEMITE DIV STEWART WARNER COR
1826 DIVERSEY PARKWAY
CHICAGO 14 ILL

M O DION
AMERICAN LUBRICANTS CO
1569 WEST 16TH ST
LONG BEACH 13 CAL

LOUIS J DI PAOLA
SOCONY MOBIL OIL CO
761 COTTAGE ST
UNIONDALE NEW YORK

EDWARD F DIRKS
TIDEWATER CO SUBUR STA BLDG
1617 PA BOULEVARD
PHILADELPHIA 3 PA

R C DISHINGTON
MOBIL OIL CO
1110 DOLORITA AV
GLENDALE 8 CAL

JAMES L DIVENS
THE CANADIAN OIL COS
P O BOX 24
WATERVILLE QUE CANADA

DONALD R DIXON
MORGAN CONSTRUCTION CO
739 GULF BLDG
PITTSBURGH 19 PA

WILLIAM N DIXON
DIXON OIL & SUPPLY CO
15 BEE HAVEN DR
WHEELING W VA

WILLIAM S DIXON JR
HUMBLE OIL & REFINING CO
8807 VINEWOOD DR
DALLAS TEXAS

RAYMOND T DIVERS
CARRIER CORPORATION
300 S GEDDES ST
SYRACUSE NEW YORK

ROBERT RAYMOND DOAK
D A STUART OIL CO LTD
1730 TRAIN AV
CLEVELAND 13 OHIO

L DON DODSON
LUBRICATION ENGINEERS INC
2807 RACE ST
FORT WORTH TEXAS

MIRTA R DOEDE
ROUTE 1
LOCKPORT ILL

C M DOERING
TEXACO INC
4700 6TH ST
PORT ARTHUR TEXAS

F MARTIN DOHL
DEE ENGINEERING CO
DEE LANE
CROMWELL CONN

HOLLIS S DOLAN
THE PENNZOIL CO
1630 W OLYMPIC BLVD
LOS ANGELES 15 CAL

HANS R DOLF
SELAS CORP OF AMERICA
DRESHER PA

HARRY A DOLSKE
MACCO PRODUCTS CO
219 DOGWOOD STREET
PARK FOREST ILLINOIS

GEO M DONAHUE
TIDEWATER OIL COMPANY
DELAWARE REFINERY
DELAWARE CITY DELAWARE

HERBERT A DORAN
SHELL OIL COMPANY
2716 TRENTMAN
FORT WAYNE INDIANA

AMOS DORINSON
SINCLAIR RES LABS INC
400 E SIBLEY BLVD
HARVEY ILL

DONALD W DORSHEIMER
TIDEWATER OIL CO
MANAKIN VIRGINIA

JOHN G DORWARD JR
DORWARD ENGINEERING CO
9 CHARLES HILL CIRCLE
ORINDA CAL

ROBERT B DOST
ALPHA MOLYKOTE CORP
7329 LAWNDALE
SKOKIE ILL

ROBERT COLVILLE DOUGALL
CRANE PACKING COMPANY
19 BROADWAY
MONTREAL E QUE CANADA

M E DOUGHERTY
ACHESON COLLOIDS CO
1426 LAND TITLE BUILDING
PHILADELPHIA 10 PA

JOHN F DOWNEY
ESSO STANDARD OIL CO
4 FARMCREST AV
LEXINGTON 73 MASS

T C DOWNEY
THE STD OIL CO OHIO
1348 VIRGINIA AV
COLUMBUS 12 OHIO

EDWARD M DOWNS
TIMKEN ROLLER BEARING CO
125 HARDING AV S
MASSILLON OHIO

WM J DRAWBRIDGE
MORGAN CONSTRUCTION CO
228 BRATTLE ST
HOLDEN MASS

MITCHELL A DRAUS
BRIDGEPORT LYCOMING
LAUREL AVENUE
DERBY CONN

J L DREHER
CALIFORNIA RESEARCH CORP
P O BOX 1627
RICHMOND 1 CAL

P H DREISSIGACKER JR
FARREL BIRMINGHAM CO
MAIN STREET
ANSONIA CONN

PERCIVAL DRIVER
ALEXANDER DUCKHAM & CO
28 BROADWALK KIDDBROOKE
LONDON S E 5 ENGLAND

LUTHER D DROMGOLD
KENDALL REFINING CO
7 SANDALWOOD DRIVE
SPOTSWOOD NEW JERSEY

HENRU E DRONEBURG
LOUIS H HEIN COMPANY
1151 MATSONS FORD ROAD
WEST CONSHOHOCKEN PA

E W DRUMMOND
INTERNATIONAL HARVESTER CO
5225 S WESTERN BLVD
CHICAGO 9 ILL

RICHARD M DURNER
TIDEWATER OIL CO
AVON REFINERY
ASSOCIATED CAL

ELMER J DUFF
AMERICAN RADIATOR
5005 HOLABIRD AV
BALTIMORE MARYLAND

MARVIN R DUKES
AMER STD RADIATOR & SAN CORP
1541 S 7TH ST
LOUISVILLE KY

MICHAEL L DU MONT
STEEL CO OF CANADA LTD
PARKDALE WORKS
HAMILTON ONT CANADA

ARTHUR W DUMOULIN
SHELL OIL CO OF CANADA LTD
1255 UNIVERSITY
MONTREAL QUE CANADA

JACK F DUNASKY
TEXACO INC
3832 CHARLOTTE AV
SAN GABRIEL CAL

WILLIAM H DUNBAR
GULF RES & DEV CO
28 ALICE AV
PITTSBURGH 5 PA

ROBERT F DUNCAN
CALUMET REFINING CO
13921 MACKINAW AV
CHICAGO 33 ILL

BRUCE M DUNHAM
SUN OIL CO
1608 WALNUT ST
PHILADELPHIA 3 PA

J C DUNLOP
SUN OIL CO LTD
3550 ST PATRICK ST
MONTREAL QUE CANADA

J R DUNLOP
J R DUNLOP CO
18609 W 7 MILES ROAD
DETROIT 19 MICH

HORTON DUNN JR
THE LUBRIZOL CORP
530 SYCAMORE DRIVE
CLEVELAND 32 OHIO

SAMUEL H DUNWOODY
FARVAL CORPORATION
62 LA SALLE ROAD
WEST HARTFORD CONN

ROBERT L DU PONT
HUMBLE OIL & REFINING CO
1020 HOLCOMBE BLVD
HOUSTON TEXAS

JOS P DURAY
PRECISION SCIENTIFIC CO
3737 W CORTLAND ST
CHICAGO 47 ILL

G A DURHAM
SHELL OIL CO INC
100 BUSH ST
SAN FRANCISCO 6 CAL

JOHN M DURHAM
CR GARLOCK PACKING CO
1863 WAZEE ST
DENVER 2 COLORADO

ANTHONY J DURSO
FISKE BROS REFINING CO
129 LOCKWOOD ST
NEWARK 5 NEW JERSEY

EUGENE H DU VAL
CARBIDE & CARBON CHEM CO
30 EAST 42ND ST
NEW YORK 17 NEW YORK

JOHN R DWELLE
CLEVELAND GRAPHITE BRONZE
17000 ST CLAIR AV
CLEVELAND 10 OHIO

ROBERT G DYE
LUTTRELL OIL CO
1622 SOUTH LEWIS PLACE
TULSA OKLA

ALEXANDER P DYER
ESSO STD OIL CO PA DIV
35 REVERE ROAD APT 7
DREXEL HILL PA

GEORGE R DYER
SINCLAIR REFINING CO
P O BOX 1710
ATLANTA 1 GA

EUGENE R DZUNA
GULF RES & DEV CO
217 HERMAN AV
DUQUESNE PA

JAMES A EANES
LION OIL COMPANY
LION OIL BUILDING
EL DORADO ARKANSAS

ALFRED W EASTON
CALTEX OIL AUSTRALIA PTY LTD
15 MURRAY ST
CROYDON N S W AUSTRALIA

HUDSON R EATON
EATON OIL CO
4256 W 49TH ST
CLEVELAND 9 OHIO

JOHN A EBERENS
CONTINENTAL OIL CO
800 COMMERCE BUILDING
NEW ORLEANS 12 LA

ALBERT G EBERLE
RENEWAL SERVICE INC
N W CORNER 17TH & LEHIGH
PHILADELPHIA 32 PA

FRED EBOCH
INTERNATIONAL RUSTPROOF
2596 ROSEWAE DRIVE
YOUNGSTOWN 11 OHIO

JACK A ECKARDT
ESSO STD DIV HUMBLE OIL
26 WESTMINSTER RD
SCARSDALE NEW YORK

ROBERT N ECSEDY
N Y & N J LUBRICANT CO
RIVERSIDE ROAD
SANDY HOOK CONN

THOMAS A EDDY
AMER BRAKE SHOE CO RR BEAR LAB
VALLEY RD
MAHWAH NEW JERSEY

DANA F EDELMAN
HYATT BEARINGS DIV GMC
247 E FIFTH AV
ROSELLE NEW JERSEY

JOHN A EDGAR
SHELL OIL CO
P O BOX 711
MARTINEZ CAL

B BRUCE EDMANDS
WASHINGTON CONN

DONALD J EDWARDS
6300 ITHACA ST
METAIRIE LOUISIANA

F M EDWARDS
TEXACO INC
2705 BEDFORD AV
RALEIGH NORTH CAROLINA

THEODORE W EDWARDS
MCGRAW HILL PUBLISHING CO
330 WEST 42ND ST
NEW YORK 36 NEW YORK

THOMAS JOHN EDWARDS
BETHLEHEM STEEL CO
8113 BLETZER RD
BALTIMORE 22 MD

E RALPH EGLOFF
ACHESON COLLOIDS CO
5328 CRAIN ST
SKOKIE ILL

FRED H EHNTS
KEYSTONE LUB CO
21ST & LIPPINCOTT ST
PHILADELPHIA 32 PA

W EHRENREICH
DOUGLAS AIRCRAFT CO
LAPHAM 827
EL SEGUNDO CAL

E J EHRET
FARVAL CORP
BOARD OF TRADE BLDG
CHICAGO 4 ILL

JOHN B EHRET
EHRET & KINSEY
141 WEST JACKSON
CHICAGO 4 ILL

MELVILLE EHRLICH
AMER LUBRICANTS INC
1575 CLINTON ST
BUFFALO 6 NEW YORK

F S EHRMAN
BOWSER INC
1302 E CREIGHTON AV
FT WAYNE 2 INDIANA

GEORGE A EHRNMAN
LINCOLN ENGRG CO
403 N 22ND ST
ALLENTOWN PA

EDW J EIFERT
UNION OIL CO
1422 S TOWNER
SANTA ANA CAL

RICHARD J EISCHENS
NORTHERN STATES POWER CO
1518 CHESTNUT AV N
MINNEAPOLIS MINNESOTA

WILLIAM EISMANN JR
E F HOUGHTON & CO
303 W LEHIGH AV
PHILADELPHIA 33 PA

LOUIS C EITZEN
LOUIS C EITZEN CO
17 W 60TH ST
NEW YORK 25 NEW YORK

ERNEST E EK
UNION OIL CO OF CAL
730 SOUTH RAYMOND AV
PASADENA CAL

PHILIP R EKLUND
WESTINGHOUSE ELECTRIC CORP
218 DATURA DRIVE
PITTSBURGH 35 PA

DONALD G ELDER
ROMAC OIL CO
1606 CONLON
WEST COVINA CAL

ALBERT M ELIAS
V R EPPERT & SON CHEM CO
21611 WEST 9 MILE RD
DETROIT MICH

SAMUEL ELLIMAN
VIGZOL OIL REF CO
VIGZOL HOUSE GREENWICH
LONDON S E 10 ENGLAND

JOHN T ELLIOTT
E F HOUGHTON & CO
16230 STEEL AV
DETROIT 35 MICH

LOREN E ELLIOTT
BROOKS OIL CO
138 GEORGE ST
HAMBURG NEW YORK

WELLS E ELLIS
TIMKEN ROLLER BEAR CO
1835 DUEBER AV S W
CANTON 6 OHIO

KURT S ELLNER
TIDEWATER OIL CO
660 MADISON AV
NEW YORK 21 NEW YORK

MAURICE ELLSON
TECALEMITE CAN LTD
54 ALGONQUIN CRESCENT
LONDON ONT CANADA

A WARREN ELROD
GULF OIL CORP
P O BOX 2140
HOUSTON TEXAS

C H ELSLEY
DOMINION FOUNDRIES & STEEL
DEPEW ST
HAMILTON ONT CANADA

KENNETH W ELVIN
SUN OIL CO
10 ELSTON RD
MONTCLAIR N J

EUGENE W EMMERICH
ALLEGHENY LUDLUM STEEL CORP
WATERVLIET NEW YORK

GEO ENDICOTT
MORGAN CONST CO
15 BELMONT ST
WORCESTER 5 MASS

L E ENDSLEY JR
TEXACO INC
12 SHELDON DRIVE
POUGHKEEPSIE NEW YORK

VERLIN H EPPERT JR
V R EPPERT & SON OIL & CHEM CO
10301 LYNDON
DETROIT 38 MICH

GEORGE G T EREN JR
DE LAVAL SEPARATOR CO
121 COULTER AV
ARDMORE PA

R O ERICKSON
SHELL OIL COMPANY
5516 GLENGARRY PARKWAY
MINNEAPOLIS 25 MINN

ROY H ERICKSON
BELL TELEPHONE LABS
WHIPPANY N J

WALTER ERICKSON
19 BATTLEFIELD
COUNTY OF WENTWORTH
STONEY CREEK ONT CANADA

DONALD G ESPEY
HUMBLE OIL & REFINING CO
21 MOUNTAIN AV
SUMMIT NEW JERSEY

CHAS W ETTER
HOBART MFG CO
PENNSYLVANIA & SIMPSON
TROY OHIO

FRED W EVANS
PENN PETROLEUM CORP
1574 W RIVER PARK DR
INKSTER MICH

HENRY H EVANS
ALEMITE CO OF ST LOUIS
404 LONG
CASEYVILLE ILL

LOUIS B EVANS
WATEROUS CO
80 E FILLMORE
ST PAUL MINNESOTA

WM T EVERITT
EASTMAN KODAK CO
KODAK PARK
ROCHESTER NEW YORK

WM EWART
ACHESON COLLOIDS CO
BOX 757
PORT HURON MICH

W J EWBANK
UNIV OKLA SCH OF MECH ENGR
NORMAN OKLAHOMA

GEORGE J EXNER
WHEELING STEEL CORP
WHEELING STEEL BUILDING
WHEELING W VA

E J M EXWORTH
PEACOCK BROS LTD
P O BOX 1040
MONTREAL QUE CANADA

MORTON Z FAINMAN
BRAY OIL CO
3344 MEDFORD ST
LOS ANGELES 63 CAL

A J B FAIRBURN
U S STEEL CORP
2799 E ERIE AV
LORAIN OHIO

DANIEL FAIRCHILD
FRAM CORPORATION
55 PAWTUCKET AV
PROVIDENCE 16 R I

S M FAIRCHILD
S FAIRCHILD & ASSOC
17 E 65TH ST
NEW YORK 21 NEW YORK

CHARLES A FALKENHAGEN JR
TENN GAS PIPELINE CO
P O BOX 2511
HOUSTON 1 TEXAS

ALBERT W M FALTER
N V BEVEROLFABRIEKE
WIJKAAN DUINERWEG 181
BEVERWIJK HOLLAND

W F FARMER
WM F FARMER CO INC
P O BOX 206 STATION A
BERKELEY 2 CAL

CLIFFORD F FARNWORTH
CANADAIAN OIL COS LTD
6010 NOTRE DAME ST E
MONTREAL 5 QUE CANADA

MICHAEL J FARRELL
STURGIS EQUIPMENT CO
1590 N WOODLAWN
ST LOUIS 22 MISSOURI

JOHN A FARRIS
AIRCRAFT POROUS MEDIA INC
30 SEA CLIFF AV
GLEN COVE L I NEW YORK

WM G FATCH
U S STEEL CORP
112 S RIDGE ST
CROWN POINT IND

DELBERT G FAUST
C A NORGREN CO
3400 S ELATI ST
ENGLEWOOD COLO

JACOB FAUST
L SONNEBORN & SONS INC
HANCOX AV
BELLEVILLE N J

WILLIAM A FAVILLE
FAVILLE LE VALLY CORP
222 W ADAMS ST
CHICAGO 6 ILL

KENNETH M FEATHER
CITIES SERVICE OIL CO
1303 3RD WILDWOOD PARKWAY
BALTIMORE 29 MARYLAND

RICHARD S FEIN
TEXACO INC
35 SHELDON DRIVE
POUGHKEEPSIE NEW YORK

I MING FENG
ESSO RES & ENGRG CO
P O BOX 51
LINDEN NEW JERSEY

GRAFTON F J FENKER
PENN REF CO
20765 MOREWOOD PKWY
ROCKY RIVER 16 OHIO

CARL S FERGUSON JR
MOBIL OIL CO
4330 CONTINENTAL DR
ALIEF TEXAS

STANLEY T E FERRY
SHELL OIL CO OF CANADA
SHELL TOWERS UNIV ST
MONTREAL QUE CANADA

JAMES S FERRIE
ONTARIO HYDRO
620 UNIVERSITY AV
TORONTO ONT CANADA

NORMAN CHARLES FESENMYER
PENNZOIL DIV
94 PORT WATSON ST
CORTLAND NEW YORK

DONALD J FESSETT
WESTERN GEAR CORP
2600 E IMPERIAL
LYNWOOD CAL

JOSEPH L FURTNETT
TEXACO INC
PATRICIA AV
FISHKILL NEW YORK

WM G FIEDRICH JR
FED MOG DV FED MO BOW BEAR INC
P O BOX 1048
ANN ARBOR MICH

GEO FINDLAY
REPUBLIC STEEL CORP
1175 S PARK AV
BUFFALO 20 NEW YORK

SAM M FINK
ALEMITE CO OF PITTSBURGH
201 SHADY AV
PITTSBURGH 6 PA

J L FINKELMANN
CHRYSLER CORP CYCLEWELD DIV
5437 W JEFFERSON
TRENTON MICH

JAMES A FINLEY JR
BROOKS OIL CO
26 HAWTHORNE PLACE
SUMMIT N J

RICHARD F FINN
ESSO RES & ENGRG CO
P O BOX 45
LINDEN NEW JERSEY

J DOUGLAS FINNIE
SHELL OIL CO CAN LTD EAST DIV
1255 UNIVERSITY ST
MONTREAL QUE CANADA

GEORGE KARLMAN FISCHER
RES LAB FOR THE ENGR SCIENCES
THORNTON HALL UNIV OF VA
CHARLOTTESVILLE VIRGINIA

EDWARD W FISHER
GARLOCK PACKING COMPANY
PALMYRA NEW YORK

HAL U FISHER
CALIFORNIA TEXAS OIL CORP
380 MADISON AV
NEW YORK 17 NEW YORK

WALTER FISHER JR
TORRINGTON CO
2527 YORK ROAD
SOUTH BEND 14 INDIANA

ROBERT A FITCH
GULF RES & DEV CO
P O DRAWER 2038
PITTSBURGH 30 PA

ROBERT M FITCH
ATLANTIC REFINING CO
117 NORTH NORWINDEN DRIVE
SPRINGFIELD PA

RALPH FITZGIBBONS
CENTRAL PETR CO
145 E 5TH ST
OSWEGO NEW YORK

ELMER E FLECK
RESEARCH APPLIANCE CO
RD NO 5 BOX 395
GIBSONIA PA

JAMES E FLEENOR
TENN EASTMAN CORP
BLDG 54 A
KINGSPORT TENN

BERNARD E FLEMING
CITIES SERVICE OIL CO
640 WEST CHAMBERS ST
MILWAUKEE WIS

C D FLEMMING
SOCONY MOBIL OIL CO INC
6 BARBARA DR
SYOSSET NEW YORK

HERBERT P FLEMING
WHITE & BAGLEY CO
P O BOX 1171
WORCESTER 1 MASS

LOUIS M FLEMING
CITIES SERVICE OIL CO
1208 CARLTON DR
ST PAUL 12 MINNESOTA

DENIS PAUL FLETCHER
ESSO STANDARD OIL S A
P O BOX 188
GEORGETOWN BRITISH GUIANA

NICHOLAS R FLETCHER
PURE OIL CO
PATTERSON HEIGHTS
BEAVER FALLS PA

VAUGHN E FLINN
CONTINENTAL OIL CO
101 UNIVERSITY BLVD
DENVER 6 COLORADO

ERNEST L FLORENCE
ACHESON DISPERSED PIGMENTS CO
1617 PENNSYLVANIA BOULEVARD
PHILADELPHIA PA

CLYDE M FLOYD
HUMBLE OIL & REFINING CO
176 BAYSHORE DRIVE
BAYTOWN TEXAS

ROLAND W FLYNN
GULF OIL CORP GULF BUILDING
712 MAIN ST
HOUSTON 1 TEXAS

RICHARD E FONTAINE
MORGAN CONSTRUCTION CO
15 BELMONT
WORCESTER 5 MASS

RICHARD J FOOTIT
GULF OIL CORP
44 GILLETTE AV
SPRINGFIELD 8 MASS

ERNEST L FORBES
HOLSTON DEFENSE CORP
BLDG 1
KINGSPORT TENN

WALTER W FORBES
AMERICAN OIL CO
2033 STANTON AV
WHITING IND

D M FORINASH
NATL CASH REGISTER CO
918 ALBERTA ST
DAYTON 9 OHIO

HERBERT L FORMAN
PUROLATOR PRODUCTS INC
970 NEW BRUNSWICK AV
RAHWAY NEW JERSEY

ROBERT E FORSYTHE
STEEL CO OF CANADA
56 HESS ST SOUTH
HAMILTON ONT CANADA

ROBERT G FORSYTHE
ONTARIO LUBRICATING CO LTD
120 CHATHAM ST
HAMILTON ONT CANADA

DAVID H FOSTER
DX SUNRAY OIL CO
P O BOX 381
TULSA OKLAHOMA

HOWARD D FOSTER
WHEELING STEEL CORP
YORKVILLE OHIO

JAMES A FOSTER SR
MILES LABS INC
1127 MYRTLE ST
ELKHART INDIANA

L POWELL FOSTER
EASTMAN CHEM PRODUCTS INC
SUBS EASTMAN KODAK CO
KINGSPORT TENN

RAYNARD FOSTER
LUB ENGRS INC
2807 RACE ST P O BOX 7128
FORT WORTH TEXAS

RICHARD H FOWLER
E F HOUGHTON & CO
2816 NORTH 26TH ST
PHILADELPHIA PA

W T FOX JR
ATLANTIC REF CO
3122 MIDVALE AV
PHILADELPHIA 29 PA

CHARLES E FRANCIS
SHELL OIL CO
BOX 262
MARTINEZ CAL

E S FRANCIS
GULF RES & DEV CO
P O BOX 2038
PITTSBURGH 30 PA

EDWARD V FRARY
UNION OIL CO OF CAL
P O BOX 510
VAN NUYS CAL

DONALD JAMES FRASER
SHELL OIL CO OF CANADA LTD
P O BOX 400 TERMINAL A
TORONTO 1 ONT CANADA

HAROLD M FRASER
INTERNATIONAL LUB CORP
P O BOX 390
NEW ORLEANS 1 LA

ELWYN M FRESH
SOCONY MOBIL OIL CO INC
988 PETERSON AV
WICHITA 12 KANSAS

ROBERT H FREE
GULF OIL CORP
P O BOX 2140
HOUSTON 1 TEXAS

T HERBERT FREEMAN
LUBRICATION DEPT 791
LUKENS STEEL CO
COATESVILLE PA

FRED F FRIEDLOB
LUBRICANTS INC
179 N MICHIGAN AV
CHICAGO 1 ILL

JAMES W FRIER
ALEMITE CO OF SO CAL
7401 N CITRUS AV
GLENDORA CAL

I T FRITZ
SINCLAIR REFINING CO
410 EAST SIBLEY BLVD
HARVEY ILL

ROBERT J FRITZ
MAC MILLAN OIL CO
P O BOX 701
ALLENTOWN PA

ROBERT W FRITZ
ALEMITE DIV STEWART WARN
335 GENEVA
BELLWOOD ILL

LEE E FRY
PHILLIPS PETROLEUM CO
804 NORTH MAIN
BROKEN ARROW OKLA

JAMES F FRYE
DX SUNRAY
BOX 989
DUNCAN OKLA

A M FUCINARI
H A MONTGOMERY CO INC
11148 STOCKWELL
DETROIT 24 MICH

HENRY M FUJII
WYNN OIL CO OF JAPAN
4 1406 NAKAMEGURO MEGURO KU
TOKYO JAPAN

DUDLEY D FULLER
COLUMBIA UNIVERSITY
DEPT OF MECH ENGRG
NEW YORK 27 NEW YORK

JAMES H FULLER
E I DU PONT DE NEMOURS
WILMINGTON DELAWARE

WILLIAM S FUTCH
TEXACO INC
P O BOX 9078
RICHMOND VIRGINIA

JAMES RUSSELL GAGE
BETHLEHEM CORNWALL CORP
GRACE MINE
MORGANTOWN PA

P J GALBREATH
TENN EASTMAN CO
1424 FAIRIDGE DRIVE
KINGSPORT TENN

ROBERT W GALLENSTEIN
SHELL OIL CO
14 DAVIS ST
NORTH ANDOVER MASS

CHARLES F GARNEY
SOCONY MOBIL OIL CO INC
59 E VAN BUREN ST
CHICAGO ILL

R E GARLINGTON JR
DX SUNRAY OIL CO
5217 EAST 17TH
TULSA 12 OKLA

ROBERT C GARRETSON
WESTINGHOUSE ELEC CORP
PLANT ENGRG DEPT ROOM 4 S 10
EAST PITTSBURGH PA

C A GARRISON
GULF REFINING CO
2516 SHANMOOR AV
NORWOOD 12 OHIO

J CALVIN GARTLEY
AMERICAN OIL CO
910 SOUTH MICHIGAN AV
CHICAGO 80 ILL

LAURENCE H GARY
TEXACO INC
219 DALEBROOK DRIVE
ALEXANDRIA VIRGINIA

E K GATCOMBE
CR C E GLANDER
1651 BARRINGTON RD
COLUMBUS 21 OHIO

J WM GAYNOR
AMERICAN OIL CO
RESEARCH LAB
WHITING IND

PAUL J GATES
F D JOHNSON CO
28815 AURORA ROAD
SOLON 39 OHIO

JOHN H GAUL
GULF OIL CORP
353 NORTH 28TH
CAMP HILL PA

J HUNTER GAUL
LINCOLN ENGINEERING CO
6TH & ANNSBURY STS
PHILADELPHIA 40 PA

Y GAVISH
PAZ OIL COMPANY LTD
4 VINE ST
HAIFA ISRAEL

WARREN H GEARY
RITTER ENGRG CO
1409 SEDGWICH ST
PITTSBURGH 33 PA

HAROLD A GEER
PRATT & WHITNEY AIRCRAFT
400 MAIN ST
EAST HARTFORD CONN

CHARLES A GEISER
TIDEWATER OIL CO
660 MADISON AV
NEW YORK 21 NEW YORK

T H GEMLO
PURE OIL CO
1201 2ND ST S
MINNEAPOLIS MINNESOTA

LEON J GENOVESE
TIDEWATER OIL COMPANY
3023 GREENPOINT AV
LONG ISLAND CITY 1 NEW YORK

CARL W GEORGI
QUAKER STATE OIL REF CORP
164 CHANDLER ST
BUFFALO 7 NEW YORK

GEO W GERBER
6505 WILSHIRE BLVD
LOS ANGELES 48 CAL

NORMAN H GERBER
ETHYL CORPORATION
1710 NATL BANK OF TULSA BLDG
TULSA 3 OKLA

GEO W GERGECEFF
GRANITE CITY STEEL CO
20TH & MADISON AV
GRANITE CITY ILL

HARRY S GERSTUNG
ALPHA MOLYKOTE CORP
65 HARVARD AV
STAMFORD CONN

EDWARD J GESDORF
SR APPLICAT ENGRG FARVAL CORP
3249 E 80TH ST
CLEVELAND 4 OHIO

PETER J GHIRLA
THE LUBRIZOL CORP
BOX 3057
CLEVELAND 17 OHIO

TRESSLIAN L GIARD
YAHN ENGINEERING & SALES CO
57 HOMESTEAD ROAD
HOLDEN MASS

MILTON K GIESE
FARMHAND DIV OF DAFFIN CORP
HOPKINS MINNESOTA

HERMAN GILBERT
PARAGON OIL CO
604 W 191ST ST
NEW YORK 33 NEW YORK

JAMES G GILBERT
SHELL OIL CO
55 PUBLIC SQUARE
CLEVELAND OHIO

WM M GILBRETH
GULF OIL CORP
P O BOX 8056
PHILADELPHIA 1 PA

C D GILCHRIST
GULF OIL CORP
100 ANTHONY WAYNE DR
WAYNE PA

ALEX GILL
THOMPSON PROD LTD
LOUTH ST
ST CATHARINES ONT CANADA

CHARLES D GILMORE
MUELLER BRASS CO
1925 LAPEER AV
PORT HURON MICH

WM D GILSON
PURE OIL CO
85 S WILLIAM ST
CRYSTAL LAKE ILL

S STEEN GILLARD
CANADIAN INTERNATL PAPER CO
LA TUGUE QUE CANADA

CHAS R GILLETTE
NEW DEPARTURE DIV GMC
VANDERBILT RD
BRISTOL CONN

JOSEPH GILMORE JR
SHELL OIL CO
27 WEST 34TH ST
BEACH HAVEN TERRACE NEW JERSEY

A G GILSON
PHILLIPS PETR CO
215 S E MORNINGSIDE AV
BARTLESVILLE OKLA

ENRIQUE GIMENEZ M
MEX TR CO SA SUN OIL CO EX REP
PINO 458
MEXICO 4 D F MEXICO

ANTHONY GIORDANO
ADAM COOKS SONS INC
5 N STILES ST
LINDEN N J

HENRY GISSER
PITMAN DUNN LAB
FRANKFORD ARSENAL
PHILADELPHIA 37 PA

JOHN WILKINSON GIVENS
SHELL DEVELOPMENT CO
144 PURDUE AV
KENSINGTON 8 CAL

W A GLAESER
BATTELLE MEM INST
433 CANYON DRIVE
COLUMBUS OHIO

EDWARD M GLASS
WRIGHT AIR DEV CTR
1132 WILSON DRIVE
DAYTON 7 OHIO

ROBERT W GLAUBIT JR
N B COCHRANE CO
344 E 33RD ST
BALTIMORE 18 MARYLAND

DONALD P GLEICHAUF
THE STANDARD OIL CO
BOX 390
AKRON OHIO

BRUCE W GLENN
L R KERNS CO
11430 LONGWOOD DR
CHICAGO 17 ILL

ERIC RONALD GLEW
TEXACO CANADA LTD
1414 BURLINGTON ST E
HAMILTON ONT CANADA

LOUIS GLIST
SHELL OIL CO
5406 57TH AV S
SEATTLE 18 WASH

ROY S GODBEY
ASHLAND OIL & REF CO
1402 FED RES BANK BLDG
CINCINNATI 2 OHIO

HERMAN E GOODARD
407 CUTLER ST
GREENEVILLE TENN

DOUGLAS GODFREY
CALIFORNIA RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

J BYRON GODSHALL
INGERSOLL RAND CO
PHILLIPSBURG N J

HERBERT C GOETSCH
MOTOR OIL REF CO
7601 W 47TH ST
LYONS ILL

L M GOLDMAN JR
LOU BOB CO
1538 W HOMER ST
CHICAGO 22 ILL

ROBERT G GOLISCH
LEDERLE LABS DIV AM CYAN
10 HILLAIRE PLACE
NANUET NEW YORK

GORDON M GOODALE
UNION CARB CHEM CO DEV DEPT
P O BOX 8361
SO CHARLESTON WEST VIRGINIA

DAVID P GOODALL
CITIES SERV OIL CO
P O BOX 7656
PHILADELPHIA 1 PA

ELDEN L GOODENOW
PAPER MATE MFG CO
1681 26TH ST
SANTA MONICA CAL

LAUREL E GOODLOE
HUMBLE OIL & REF CO
BOX 13224 WALNUT HILL STA
DALLAS TEXAS

DAVID B GORDON
SOCONY MOBIL OIL CO
26 BROADWAY ROOM 211
NEW YORK 4 NEW YORK

ROBERT L GORDON
DRYDEN OIL CO INC
RT 4 BOX 336
ANNAPOLIS MARYLAND

GEORGE S GORDON
ADAM COOKS SONS INC
5 N STILES ST
LINDEN N J

JAMES A GORDON
JAMES T GORDON CO
233 BROADWAY
NEW YORK 7 NEW YORK

MYRON S GORDON
U S N ENGINEERING
EXPERIMENT STATION
ANNAPOLIS MD

PAUL G GORDON
O L KING CO
640 GILMAN ST
BERKELEY 10 CAL

HAROLD R GORMAN
PITTSBURGH PLATE GLASS CO
GLASS RES CENTER BOX 11472
PITTSBURGH 38 PA

LAWRENCE J GORRY JR
CITIES SERV R & D CO
CRANBURY N J

H R GORSUCH
STANDARD OIL CO
BOX 1099
KANSAS CITY 41 MO

WILLIAM D GOSSET
CANADA PACKERS LTD
2200 ST CLAIR AV W
TORONTO 14 ONT CANADA

ARTHUR GOSSMAN
RATCLIFFS CANADA LTD
378 ELMWOOD AV
RICHMOND HILL ONT CANADA

NORMAN M GOTTFRIED
JOHN B MOORE CORP
4564 PENN AV
PITTSBURGH 24 PA

C A GOUGHNOUR
UNION OIL CO OF CAL
2700 F ST
BAKERSFIELD CAL

ELMER H GOULD
SOCONY MOBIL OIL CO
200 GLENWOOD
HADDONFIELD N J

P H GOULD
JOHNS MANVILLE SALES CORP
STANDARD OIL BLDG
BALTIMORE 2 MD

ROBERT K GOULD
TEXACO INCORPORATED
P O BOX 509
BEACON NEW YORK

LESLIE P GRAFF
GULF OIL CORP
P O BOX 2140
HOUSTON 1 TEXAS

CHARLES F GRAHAM
AMERICAN OIL CO
903 GRANT BUILDING
PITTSBURGH PA

HENRY T GRAHAM
STANDARD OIL CO OF CALIF
225 BUSH ST
SAN FRANCISCO CAL

J K GRAHAM
DRUMMOND & CO LTD
485 MC GILL ST
MONTREAL QUE CANADA

JOHN P GRAHAM
PHILLIPS PETROLEUM CO
122 MULBERRY LANE
BARTLESVILLE OKLA

ROBERT M GRAHAM
ESSO STD DIV HUM OIL & REF CO
DUNDALK AV NR EASTERN
BALTIMORE 24 MD

JAMES A GRAMLING
EHRET & KINSEY
3904 W VLIET ST
MILWAUKEE 8 WIS

HAROLD W GRAMS
GRAMS OIL CO INC
312 11TH ST
SOUTH VIRGINIA MINN

RAYMOND G GRANQUIST
FAFNIR BEARING CO
BOOTH ST
NEW BRITAIN CONN

ROBERT G GRANT
EATON MFG CO RESEARCH CENTER
26201 NORTHWESTERN HIGHWAY
SOUTHFIELD MICH

JULES D GRATIOT
JULES D GRATIOT CO
3423 VERDUGO RD
LOS ANGELES 65 CAL

CARL O GRAVES
CIN MILL MACH CO
2454 INDIAN MOUND AV
NORWOOD 12 OHIO

DONALD L GRAY
OAK RIDGE NATL LAB
112 LOCUST LANE
OAK RIDGE TENN

REGINALD C GRAY
CALIF RES CORP
576 STANDARD AV
RICHMOND 1 CAL

NORMAN L GREGG JR
GULF OIL CORP
P O BOX 8056
PHILADELPHIA 1 PA

A W GREEN
THE IRONSIDES CO
7718 RIDGELAND
CHICAGO ILL

DOUGLAS H GREEN
WYANDOTTE CHEMICALS CORP
1609 BIDDLE AV
WYANDOTTE MICH

EDWARD G GREEN
ALLISON DIV OF GMC
R R 2 BOX 191
BROWNSBURG INDIANA

PHILIP T GREEN
PANAMA CANAL CO
BOX 213
BALBOA CANAL ZONE

WILSON P GREEN VICE PRES
GEN MGR GILMAN ENGRG & MFG
305 W EASTERN AV
JANESVILLE WIS

ROBERT M GREENBERG
COMMERCIAL FILTERS CORP
2 MAIN ST
MELROSE 76 MASS

A D GRESSEL
RES OIL & REFINING CO
3680 VALLEY ROAD
CLEVELAND 9 OHIO

JOHN Q GRIFFITH 111
184 HONEYWELL DR
RADNOR GREEN
CLAYMONT DELAWARE

EMILF E GRIGNARD
CELANESE CHEM CORP
210 03 43RD AV
BAYSIDE N Y

DAN M GRIGSBY
HYDROTEX INDUSTRIES
4333 N GENT EXP P O BOX 2400
DALLAS TEXAS

JOHN R GRIMLEY
CELANESE CHEMICAL CO
316 OAKWOOD
PARK FOREST ILL

RUSSELL G GROTHUS
BELL & HOWELL CO
7100 MC CORMICK RD
CHICAGO 45 ILL

WILLIAM R GROSS
ATLANTIC REFINING CO
82 BONNET LANE
HATBORO PA

G B GROSSETT
1 RICKSHAW AV
ETORICOKE ONT CANADA

A J GROWALL
JONES & LAUG STEEL CP ALIQ WKS
P O BOX 490
ALIQUIPPA PA

DONALD E GRUBE
OWENS ILL GLASS CO ENG TEC CTR
1700 N WESTWOOD AV
TOLEDO OHIO

EDWARD J GRUBER
CR R V ROBISON CO
832 STANDARD BUILDING
CLEVELAND 13 OHIO

GEORGE A GRUBER
MAGNOLIA PETROLEUM CO
P O BOX 1740
HOUSTON TEXAS

JEROME M GRUBER
WAUKESHA BEARINGS CORP
COMMERCE & ELLIS STS
WAUKESHA WIS

THOMAS J GRUBER
FARVAL CORP
3249 E 80TH
CLEVELAND 4 OHIO

CHARLES A GRUBERT
BELL & HOWELL CO
7100 MC CORMICK RD
CHICAGO 45 ILL

WALTER GRUCA
STANDARD FORGINGS CORP
8256 COLUMBIA AV
MUNSTER IND

JAMES GRUENWALD
A O SMITH CORP
3533 N 25TH ST
MILWAUKEE 18 WIS

PAUL GUBBELS
BELGIAN SUN OIL CO S A
JACOBS ST 11
ANTWERP BELGIUM

JOHN P GUCKERT
ESSO STD DIV HUMBLE OIL
7006 YORK RD
BALTIMORE 12 MD

S A GUDMUNDSEN
KENNCOTT COPPER CORP
2983 MORGAN DRIVE
SALT LAKE CITY 17 UTAH

E G GUENTHER
TENN EASTMAN CORP
1612 FAIRIDGE PL
KINGSPORT TENN

JOHN M GUERRA
YAHN ENGINEERING & SALES
45 CADY ST
LUDLOW MASS

HAROLD E GULVIN
EAST STATES FARMERS EXC
26 CENTRAL ST
WEST SPRINGFIELD MASS

LESTER H GUMM
PATE DIV HUMBLE OIL & REF CO
3056 NORTH 83RD ST
MILWAUKEE 10 WIS

F ALLAN GUNDERSON
VICKERS INC
1832 W 27TH ST
SAN PEDRO CAL

RAYMOND C GUNTHER
SOCONY MOBIL OIL CO INC
201 FAIRLAMB AV
HAVERTOWN PA

MICHAEL M GURGO
ESSO STD DIV HUM OIL & REF CO
34TH & SMALLMAN STS
PITTSBURGH 1 PA

DONALD A GUSTAFSON
CLEVELAND GRAPHITE BRONZE
17000 ST CLAIR AV
CLEVELAND 10 OHIO

JACK H GUSTAFSON
MARLIN ROCKWELL CORP
402 CHANDLER ST
JAMESTOWN NEW YORK

ROBERT H GUY
DETROIT TRANSMISSION GMC
25455 ROUGE RIVER DR
DEARBORN 6 MICH

C DAVID HAACKE
LEHIGH CHEMICAL CO
FLATLAND ROAD
CHESTERTOWN MD

WALTER C HADLEY
BUNNYBROOK FARM
COLEBROOK CONN

JOHN T HAGY
BESSEMER METALS CORP
625 GROSS ST
PITTSBURGH 24 PA

LOWELL H HALE
AMERICAN ENKA CORP
LOWLAND TENN

DAVID A HALL
EASTMAN KODAK CO
KODAK PARK
ROCHESTER 4 NEW YORK

HOWARD B HALL
THE STD OIL CO OHIO
163 NAPLE DRIVE
YOUNGSTOWN 12 OHIO

R W HALL
TEXACO INC
P O BOX 2332
HOUSTON 1 TEXAS

WILLIAM O HALL
C A NORGREN CO
3400 SOUTH ELATI
ENGLEWOOD COLORADO

JAMES R HALTER
EASTMAN KODAK CO
KODAK PARK BLDG 23
ROCHESTER NEW YORK

OEMAR HALVORSEN
STEEL CO OF CAN SWAMSEA WORKS
1 WINDEMERE
TORONTO SWAMSEA ONT CANADA

JOSEPH F HAMLET
ESSO STD DIV HUM OIL & REF CO
19 NEPTUNE DR
SHREWSBURY MASS

DAVID LEE HAMILTON
ESSO STANDARD
85 6 FERNE BOULEVARD
DREXEL HILL PA

GLENN H HAMILTON
LUBRICATION ENGINEERS INC
P O BOX 97
WESTLEY CAL

ALLAN C HAMMAREN
SHELL OIL CO
181 BASTER LANE
MILFORD CONN

F S HAMMERSTEIN
MOBIL OIL CO
BOX 563
OGDEN DUNES GARY IND

HEINZ HANAU
10584 HI POINT
LOS ANGELES 35 CAL

IRVING HANDSHUH
ACME REFINING CORP
12 LISTER AV
NEWARK 5 NEW JERSEY

EDWARD T HANEY
FISKE BROS REFINING CO
1844 LONDON ROAD
ABINGTON PA

SIDNEY HANFORD
CANADA PACKERS LTD
60 PAYTON ROAD
TORONTO ONT CANADA

FRED J HANLY
CALIF RESEARCH CORP
576 STANDARD AV
RICHMOND CAL

C S HANSEN
PURE OIL CO
200 EAST GOLF ROAD
PALATINE ILL

E M HANSEN
SUPERIOR DESIGN INC
P O BOX 194
KENILWORTH NEW JERSEY

ISAAC PATRICK HANSEN
DOUGLAS AIRCRAFT CO
5400 W 117TH ST
INGLEWOOD CAL

OLE V HANSEN
FISHER BODY DIV GMC
10076 HART
HUNTINGTON WOODS MICH

VIRGIL C HUTTON
DELCO PRODS DIV GM
329 EAST FIRST ST
DAYTON OHIO

M A HANSON
MAGNUS METAL CORP
60 EAST JACKSON
CHICAGO 4 ILL

RAYMOND H HARBIN
AJAM LABS INC
9060 MONTANA
LIVONIA MICH

CLAYTON D HARDESTY
TEXACO INC
1355 PHILADELPHIA DR
DAYTON 6 OHIO

BRENT T HARDING
MIDWEST OIL CO
190 GLEASON LAKE ROAD
WAYZATA MINNESOTA

ED D HARKINS SR
THE FARVAL CORPORATION
6349 GUILFORD AV
INDIANAPOLIS 20 INDIANA

HUGH H HARKINS
BRYTON CHEMICAL CO
1270 AVENUE OF AMERICAS
NEW YORK 20 NEW YORK

I M HARLOW
TIDEWATER OIL CO
1799 MAGRO DRIVE
CONCORD CAL

HARRY P HARMON
STP SALES CO DV OF MALTHY CP
4816 HOLLIS ST
EMERYVILLE CAL

T F HARMS
REFINERS MKTG CO LTD
1010 WILSHIRE BLVD ROOM 601
LOS ANGELES 17 CAL

HASKELL HARR
TENNESSEE EASTMAN CO
KINGSPORT TENN

RICHARD J HARRINGTON
INDUSTRIAL MAINT CO
17 RANELEGH ROAD
BOSTON 35 MASS

C H HARRIS
PHILLIPS PETROLEUM CO
BOX 1121
TULSA OKLA

DONALD F HARRIS
GULF PETROLEUM S A
APARTADO 1174
PANAMA R P

E RALPH HARRIS
ALEMITE CO OF ST LOUIS
4603 MCREE
ST LOUIS 10 MO

HENRY M T HARRIS
AMERICAN BRAKE SHOE
450 HARTUNG DRIVE
WYCKOFF NEW JERSEY

SIDNEY G HARRIS
JOSEPH DIXON CRUCIBLE CO
JERSEY CITY NEW JERSEY

THOMAS H HARRIS
BOSTON EDISON CO
7 DORIS ROAD
FRAMINGHAM MASS

DALE KENT HARRISON
CITIES SERVICE OIL CO
2559 LUND AV
ROCKFORD ILLINOIS

DONALD K HARRISON
TEXACO INC
234 N TROTWOOD AV
SAN PEDRO CAL

FRANK R HART
STANDARD OIL CO OF CALIF
200 BUSH ST ROOM 1609 A
SAN FRANCISCO 20 CAL

HENRY LOUIS HARTIG
MINNEAPOLIS GAS COMPANY
800 LINDEN NORTH
MINNEAPOLIS 3 MINNESOTA

A L HARTLEY
THE CINCINNATI MILL MACH CO
MARBURG & MADISON RDS
CINCINNATI 9 OHIO

LYNN F HARTMANN
ALEMITE CO OF ST LOUIS
40 ROLLING HILLS DRIVE
FLORISSANT MISSOURI

JAMES R HARTNEY
IMPERIAL OIL LTD
111 ST CLAIR AV W
TORONTO ONT CANADA

H A HARTUNG
CONSULTANT
902 COLLINS ST
WEST COLLINGSWOOD NEW JERSEY

PAUL D HARTZELL
CATERPILLAR TRACTOR CO
PEORIA ILLINOIS

EVERETT B HARVEY JR
FISKE BROS REFINING CO
53 SUNSET DRIVE
NORTHBORO MASS

CLARENCE L HASEROT
ACHESON COLLOIDS CO
2736 E WALNUT ST
PASADENA CAL

THOMAS F HATCH
J P MURRAY CO
311 ROSS ST
PITTSBURGH 19 PA

ROGER E HATTON
MONSANTO CHEMICAL COMPANY
800 NORTH LINDBERGH BLVD
ST LOUIS 66 MISSOURI

WARREN M HATZELL
MESSINGER BEARING INC
D ST ABOVE ERIE AV PO BX 7256
PHILADELPHIA 1 PA

EDWARD L HAUGHEY
WESTINGHOUSE ELEC CORP
GENESEE ST
BUFFALO 5 NEW YORK

CHAS J HAUSER
SUN OIL COMPANY
284 HUMBOLDT ST
ROCHESTER NEW YORK

ALEXANDER HAVELOCK
NORTH STAR OIL LTD
303 SCOTT BLOCK
WINNIPEG MAN CANADA

EDWIN S HAWKINS
PURE OIL CO
1314 EAST 9TH STREET RD
RICHMOND VIRGINIA

M C HAWKINS
REYNOLDS METALS CO
211 DUNDEE AV
RICHMOND 25 VA

LELAND GLEN HAY
ALLIS CHALMERS MFG CO
3000 S 6TH ST
SPRINGFIELD ILLINOIS

DONALD M HAYAS
ALLEGHENY LUDLUM STEEL CO
RIVER ROAD
BRACKENRIDGE PA

HENRY H HAYDUK
SHELL OIL CO
1219 WESTLAKE NO
SEATTLE 11 WASHINGTON

MATTHEW N HAYES
WESTINGHOUSE
P O BOX 2025
BUFFALO 5 NEW YORK

THOMAS W HAYES
HUGHS AIRCRAFT CO
5643 HAZELTON AV
CULVER CITY CAL

WILBUR D HAYNE JR
AMERICAN OIL CO
BOX 431
WHITING IND

ARLIE HAZZARD
GLEASON WORKS
1000 UNIVERSITY AV
ROCHESTER 3 NEW YORK

GEORGE F HEATH
GEORGE F HEATH CO INC
4030 CHOUTEAU AV
ST LOUIS 10 MISSOURI

JOHN T HEATON
CHAMPION PRODUCTS INC
BOX 291
STEPHENVILLE TEXAS

J W HEBDEN
LOUISVILLE & NASH RAILROAD CO
LOUISVILLE KY

GEORGE E HEBNER
DAVIS HOWLAND OIL CORP
SOUTH AV AT GRIFFITH
ROCHESTER 7 NEW YORK

JOHN A HECK
KOPPERS COMPANY INC
355 LANCASTER AV
HAVERFORD PA

CECIL LYTELL HEDRICK
SEABRIGHT CONSTRUCTION CO
4201 WOOD
WHEELING W VA

HENRY K HEICK
CERTEL BREWING CO
1400 STORY AV
LOUISVILLE KY

JOSEPH P HEIDT
HEIDT & MCLAVERTY
1825 NAPFLE ST
PHILADELPHIA 11 PA

DONALD L HEIMES
TEXACO INC
1730 CLIFTON PLACE
MINNEAPOLIS 3 MINN

ARTHUR L HEINTZE
CONSULTING ENGINEER
2643 BOPP ROAD
ST LOUIS 22 MISSOURI

FRED S HELLING
PENN CENTRAL CO
2727 ROE
KANSAS CITY 3 KANSAS

HARVEY L HEMINGWAY
TEXACO INC
P O BOX 1137
SALT LAKE CITY 10 UTAH

HUGH L HEMMINGWAY
THE PURE OIL CO
RESEARCH CENTER
CRYSTAL LAKE ILL

R H HENDRICK
ACHESON COLLOIDS CO
1635 WASHINGTON
PORT HURON MICH

K R HENDERSON
H C BURTON CO LTD
166 REBECCA ST
HAMILTON ONTARIO CANADA

JOHN S HENDRICKSON
PURE OIL CO
P O BOX 63
ESKO MINN

THOMAS C HENDRICKSON
MIDWEST OIL CO
4509 VALLACHER AV
ST LOUIS PARK MINNESOTA

KARL G HENRIKSON
SOCONY MOBIL OIL CO INC
150 EAST 42ND ST
NEW YORK 17 NEW YORK

HULL HENKEL
METAL LUBRICANTS CO
3535 S OAKLEY
CHICAGO 9 ILL

FRED R HENNIG
ASHLAND OIL & REFINING CO
10089 BEACONS FIELD DRIVE
PARMA HEIGHTS OHIO

RICHARD V HENSLEY
CITIES SERVICE OIL CO
BOX 408
PEKIN ILLINOIS

R E HERGENROETHER
PILLSBURY CHEMICALS
31072 WINDSOR
GARDEN CITY MICH

ANDREW J HERKALO
LOUIS H HEIN COMPANY
1151 MATSONS FORD ROAD
WEST CONSHOHOCKEN PA

ROGER HERMAN
GULF OIL BELGIUM
AVENUE DE FRANCE 53 55
ANTWERP BELGIUM

WILLIAM J HERMAN JR
CITIES SERVICE RES & DEV CO
P O BOX 402
CRANBURY NEW JERSEY

CHAS HERMANN
APEX MOTOR FUELS CO INDUST DIV
1401 W NORTH AV
CHICAGO 22 ILL

MAYO D HERSEY
DIV OF ENGINEERING
BROWN UNIVERSITY
PROVIDENCE 12 R I

J T HERZOG
TEX & NEW ORLEANS RR CO
P O BOX 219
HOUSTON 1 TEXAS

JOHN H HERSHISER
U S STEEL CORP
545 CENTRAL AV
JOHNSTOWN PA

JOHN D HETCHLER
WERNER G SMITH INC
1730 TRAIN AV
CLEVELAND 13 OHIO

JAMES R HICKS
SOCONY MOBIL OIL CO INC
SOUTHERN BLVD
CHATHAM NEW JERSEY

EDWIN M HIGGINS
MASTER LUBRICANTS CO
808 RIDGE LANE
PARKRIDGE MEDIA PA

GEORGE H HILDERBRAND JR
THE LUBRIZOL CORP
505 NORTH WASHINGTON
NAPERVILLE ILLINOIS

AUBREY D HILL
SINCLAIR REFINING CO
600 FIFTH AV
NEW YORK 20 NEW YORK

DAVID L HILL
ROCKWELL STD CP TRAN & AXLE DV
2874 COLONIAL WAY
BLOOMFIELD HILLS MICH

GEOFFREY F HILL
CANADAIAN D A STUART OIL CO
26 BELHOME AV R R 3
BRANTFORD ONT CANADA

WILLIAM H HILL
NATL OIL & CHEM CORP
1000 FOREST AV
HAMILTON OHIO

WILLIAM J HILL
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER 5 MASS

W P HILLIKER
AMERICAN OIL CO
555 FIFTH AV
NEW YORK 17 NEW YORK

ROBERT D HILLS
BIG A CO TORONTO LTD
128 SUNRISE AV
TORONTO 16 ONT CANADA

JOHN R HILPERT JR
SHELL CHEM CO
151 E 216TH ST
TORRANCE CAL

R W HIMROD
FED MOGAL BOWER BEARINGS INC
13836 PURITAN AV NAT SEAL DIV
DETROIT 27 MICH

AHMAD EL HINDI
U S HOFFMAN MACH CORP
THOMPSON ROAD
SYRACUSE NEW YORK

JAMES G HINKLE
THE FRANKLIN INST LABS
6 FRANKLIN GATE DRIVE
BROOMALL PA

J FRANKLIN HINSLEY
TEXACO INC
728 FISHER BUILDING
DETROIT 2 MICH

EDWARD W HITCHCOCK
RUST LICK INCORPORATED
MAIN ST
GRANITEVILLE MASS

JOHN H HITCHCOCK
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER 5 MASS

STEPHEN M HITCHCOCK
TRIANGLE MFG CO
714 DIVISION ST
OSHKOSH WIS

JOHN K HOBAN
NEWPT NEWS SHIP & DRYDOCK CO
320 62ND ST
NEWPORT NEWS VA

PAUL DARNELEY HOBSON
SHELL OIL CO RES LAB
P O BOX 262
WOOD RIVER ILLINOIS

W E HOCH
VISCOSITY OIL CO
3200 SOUTH WESTERN AV
CHICAGO 8 ILL

JACK R HODGES
SOUTHWEST GREASE & OIL CO INC
220 W WATERMAN
WICHITA KANSAS

J WAYNE HODGES
THE CARTER OIL COMPANY
910 5TH AV
SEATTLE 4 WASHINGTON

LEE N HODSON JR
THE HODSON CORP
5301 WEST 66TH ST
CHICAGO 38 ILL

WALTER H HODSON
THE HODSON CORP
5301 WEST 66TH ST
CHICAGO 38 ILL

CLARENCE D HODGSON
CONTINENTAL OIL CO
730 DES MOINES BLDG
DES MOINES 9 IOWA

DON E HODGSON
THE FRANKLIN OIL & GAS CO
P O BOX 30
BEDFORD OHIO

STANLEY HOEFER
D A STUART OIL CO LTD
2727 SOUTH TROY
CHICAGO 23 ILL

CALVIN A HOEFFLER
FORD MOTOR CO
427 WINRY
ROCHESTER MICH

FRANK E HOEHN
COPPERWELD STEEL CO
MAHONING AV
WARREN OHIO

GEORGE HOFFMANN
THE ELCO LUBRICANT CORP
JENNINGS & DENISON AV
CLEVELAND 9 OHIO

WILLIAM H HOFFMAN
STANDARD OIL CO OF CALIF
1520 POWELL ST
EMERYVILLE CAL

ROBERT F HOFMANN
DELCO APPLIANCE DIV GMC
226 MENARD DR
ROCHESTER 16 NEW YORK

JOHN F HOGAN 111
SUN OIL CO
3566 SCHWARTZE AV APT 3
CINCINNATI 11 OHIO

THOMAS D HOGAN 111
DOUGLAS AIRCRAFT CO
6720 WARDLOW ROAD
LONG BEACH 8 CAL

WM C HOHMANN
STD OIL CO OF OHIO
20161 WESTWAY AV
ROCKY RIVER 16 OHIO

GAYLORD E HOLD
WYNN OIL CO
1151 WEST FIFTH ST
AZUSA CAL

ROBERT W HOLDING
N AMERICAN AVIATION
14102 ARDATH AV
GARDENA CAL

HERBERT K HOLM
SONNEBORN CHEM & REFINING CO
9 SOUTH CLINTON ST
CHICAGO 6 ILL

BRUCE J HOLMBERG
MOBIL OIL CO
558 ASHLAND AV
RIVER FOREST ILL

CLYDE P HOLLAND
MOBIL OIL CO
1004 NORFLEAF DRIVE
NASHVILLE TENNESSEE

LEONARD C HOLLAND
SHELL OIL CO
315 DERBY ST
OAKLAND 1 CAL

KEITH M HOLLEY
ARCHER DANIELS MIDLAND CO
2191 WEST 110TH ST
CLEVELAND 2 OHIO

WM C HOLLIBAUGH
R & D DEPT SUN OIL COMPANY
1608 WALNUT ST
PHILADELPHIA 3 PA

D F HOLLINGSWORTH
E I DU PONT DE NEMOURS ENG DEP
LOUIVERS BUILDING
WILMINGTON 98 DELAWARE

JACKSON W HOLLIS JR
FARREL BIRMINGHAM CO INC
P O BOX 2071
BUFFALO 7 NEW YORK

CHARLES G HOLLISTER
UNION CARBIDE PLASTICS COMPANY
BOUND BROOK NEW JERSEY

K L HOLLISTER
TEXACO INCORPORATED
411 FISHER BUILDING
DETROIT 2 MICH

EDWARD HOLODNIK
GULF RES & DEV CO
P O BOX 2038
PITTSBURGH 30 PA

EMERSON D HOLMAN
KAISER ALUMINUM & CHEM CORP
P O BOX 671
NEWARK OHIO

GLENN E HOLMAN
PHILLIPS PETROLEUM CO
813 YALE DRIVE
BARTLESVILLE OKLAHOMA

JOHN J HOLMES
INTERNATIONAL HARVESTER CO
NORTH AV MANNHEIM RD
MELROSE PARK ILL

RICHARD L HOLMES
CONTINENTAL OIL CO
912 BAKER BUILDING
MINNEAPOLIS 2 MINN

ROBERT F HOLMES
CASTROL LIMITED
CORN MILLER ST & BULAWARA RD
PYRMONT NSW AUSTRALIA

ROBERT T HOLMES
SHELL OIL CO PRODUCTS APP DEPT
625 S MICHIGAN AV
CHICAGO 5 ILL

WILLIAM W HOLT
THE AMERICAN OIL CO
555 5TH AV
NEW YORK 17 NEW YORK

RICHARD A HOLSTEDT
D A STUART OIL CO LTD
2727 SOUTH TROY
CHICAGO 23 ILL

GORDON H HOMMER
TIDEWATER OIL CO
1224 GLENWOOD DR
CONCORD CAL

WALTER E HOOPER
F & W URSEM CO
BOX 3052
YOUNGSTOWN 11 OHIO

J H HOOTEN
GULF OIL CORP
1078 BEECHAVEN RD N E
ATLANTA GEORGIA

JAMES W HOPKINSON
PENN PETROLEUM CO
10160 W OUTER DR
DETROIT 23 MICH

RUSSELL O HOPKINSON
PENN PETROLEUM CORP
13449 FARLEY
DETROIT 39 MICH

LAWRENCE D HOPPES
CONTINENTAL OIL CO
BOX 2250
SALT LAKE CITY 10 UTAH

EMERSON HORNE
EASTERN AIR DEVICE
HOBBS ROAD
NORTH HAMPTON N H

HARRY ALLEN HORTON
IMPERIAL OIL LTD
475 VICTORIA AV
HAMILTON ONT CANADA

ANTHONY G HORVATH
MASTER ELEC CO
805 MANHATTAN AV
DAYTON 6 OHIO

LOWELL C HORWEDEL
ELECTROFILM INC
7116 LAUREL CANYON BLVD
NORTH HOLLYWOOD CAL

LOUIS HORWOOD
A T SUPPLY INC
7 TERRACE
BUFFALO NEW YORK

CHRISTOPHER HOSFORD
BRITISH AMERICAN OIL CO
105 MAIN ST E
GRIMSBY ONT CANADA

NORMAN R HOSTLER
TIDEWATER OIL CO
116 FORSYTHIA DR
LEVITTOWN PA

HOMER R HOTEN
ESSO STD OIL CO
UNION ST
GUILFORD CONN

EMERSON M HOUGH
KERR MCGEE OIL INDUST INC
KERR MCGEE BUILDING
OKLAHOMA CITY 2 OKLAHOMA

EDWARD M HOUSE
HUMBLE OIL & REFINING CO
1020 HOLCOMBE BLVD
HOUSTON 25 TEXAS

HAROLD C HOUTS
SHELL OIL CO
4336 W WRIGHTWOOD
CHICAGO 39 ILL

ELLIOT L HOVEL
HUMBLE OIL REFINING CO
BOX 1754
ALBUQUERQUE NEW MEXICO

DONALD W HOWARD
GULF RES & DEV CO
109 BURKE DRIVE
MONROEVILLE PA

JOHN E HOWARD
TEXACO INC
P O BOX 509
BEACON NEW YORK

NELSON A HOWARD JR
MANUFACTURERS REP
476 HUNTINGTON DR BOOTH BLDG
SAN MARINO CAL

ROGER A HOWARD
TEXACO INCORPORATED
34 COLBURN ST
WESTWOOD MASSACHUSETTS

WARREN H HOWARD
MORGAN CONSTRUCTION CO
739 GULF BLDG
PITTSBURGH 19 PA

WILLIAM T HOWCROFT
WHEELING STEEL CORP
STEUBENVILLE OHIO

FRED M HOWES
MOBIL OIL CO
3530 LOU ELLA LANE
RIVERSIDE CAL

LLEWELLYN E HOYER
AMERICAN BRAKE SHOE
VALLEY ROAD
MAHWAH NEW JERSEY

H W HUBBELL
VALVOLINE OIL CO
REFINERY LAB
FREEDOM PA

WENDELL A HUBBELL
STD OIL CO OF CAL
605 W OLYMPIC BLVD
LOS ANGELES 15 CAL

C F HUBER
EMERY INDUSTRIES
4900 ESTE AV
CINCINNATI 17 OHIO

WM J HUDSON
ROBERT W HUNT CO
305 KENILWORTH AV
KENILWORTH ILL

MELVIN E HUFF
CITIES SERVICE OIL CO
4402 DELRAY ST N W
ROANOKE VIRGINIA

HAROLD J HUGHES
CASTROL LIMITED
254 266 DOREMUS AV
NEWARK 5 NEW JERSEY

JOHN D HUGHEY
THE PACQUIN CO
2917 WESTBROOK DRIVE
CINCINNATI 38 OHIO

DENVER H HULL
RICH OIL CORP RES & DEV LABS
1900 CHESTNUT ST
ANAHEIM CAL

C E HULME
KENDALL REFINING CO
77 NORTH KENDALL AV
BRADFORD PA

W HERBERT HULTGREN
PUROLATOR PRODUCTS INC
3723 WILSHIRE BLVD
LOS ANGELES CAL

CLINTON R HUMMER
SINCLAIR REFINING CO
143 MCINTOSH
CLARENDON HILLS ILL

ROBERT L HUMPHREYS
BETHLEM STEEL CO
923 BREEZEWICK CIRCLE
TOWSON 4 MARYLAND

AL HUNDERE
ALCOR INC
2905 BANDERA ROAD
SAN ANTONIO TEXAS

RICHARD P HUNNICUTT
DALMO VICTOR CO
10 BURGOYNE CT
SAN MATEO CAL

NORMAN A HUNSTAD
GM RESEARCH LABORATORIES
12 MILE & MOUND ROADS
WARREN MICH

ROBERT G HUNT
ATLANTIC REFINING CO
CHAMBER OF COMMERCE BLDG
PITTSBURGH PA

CECIL L HUNTER
THE NATL REFINING CO
STANDARD BLDG P O BOX 6479
CLEVELAND 1 OHIO

FRANK M HUNTER
ACHESON COLLOIDS CO
3120 MAPLEWOOD DR
PORT HURON MICH

WILLIAM F HUSS
AMER ELEC POWER SERV CORP
BOX 565
HUNTINGTON WEST VIRGINIA

HERBERT M HUTCHINS
UNITED OIL COMPANY INC
4405 E BALTIMORE ST
BALTIMORE MARYLAND

LESLIE W HUTCHINS
ESSO STD OIL CO
30 ALBAN ROAD
WABAN MASS

LOUIS M HUTCHINSON
ARABIAN AMERICAN OIL CO
CR CENTRAL TECH LIBRARY
DHAHRAN SAUDI ARABIA

WILLIAM J HUTH
SUN OIL CO
PLEASANT GROVE SCHOOL RD
WEST CHESTER PA

JOHN A INGLIS JR
ESSO STD DIV HUM OIL & REF CO
1628 HEATHFIELD RD
BALTIMORE 12 MD

WELDON H IRBY
CR PIMA MINING CO
BOX 7187
TUSCON 3 ARIZONA

MAURICE O IRELAND
BILTMORE OIL CO OF CALIF
P O BOX 1463
RICHMOND 1 CAL

HARRY W IRION
NATL REFINING CO
1885 COVENTRY ROAD
COLUMBUS 12 OHIO

ALEXANDER IRONSIDE
CANADIAN ACME SCREW & GEAR LTD
207 WESTON RD
TORONTO ONT CANADA

CHARLES W IRWIN
SHELL OIL CO
154 BAGLEY
DETROIT 26 MICH

H G ISBELL
1000 N CAMINO ALTO
VALLEJO CAL

ARTHUR N ISENBERG
GULF OIL CORP
21ST & DECAT STS P O BX 4155
RICHMOND VA

JAN L IVEY
UNION CARBIDE CHEMICAL CO
413 WILLOW
LAMARQUE TEXAS

EDWARD J JACHIM
VAN STRAATEN CHEMICAL CO
512 MACE ST
GREENSBURG PA

CHARLES JACKSON
ANALYSTS INCORPORATED
2910 FORD ST
OAKLAND 1 CAL

DUDLEY C JACKSON
DUDLEY C JACKSON INC
2721 MT ROYAL CIRCLE
BIRMINGHAM 16 ALA

EARL G JACKSON
NATL RESEARCH CORP
70 MEMORIAL DR
CAMBRIDGE 42 MASS

STEPHEN JOHN JACOBS
ACHESON COLLOIDS
11571 FITCHBURG LANE
CINCINNATI 40 OHIO

HAROLD P JOHNSON
SUN OIL CO
85 RICHARD ROAD
NEEDHAM MASS

ROBERT N JACKSON
MOBIL OIL CO
11406 GLENDALE WAY
SEATTLE 88 WASHINGTON

WILLIAM B M JACKSON
CONTINENTAL OIL COMPANY
P O BOX 1342
ALBUQUERQUE NEW MEXICO

ARTHUR R JACOBS
JOS SCHLITZ BREWING CO
235 W GALENA ST
MILWAUKEE 12 WIS

ROY W JACOBS
ALUMINUM CO OF AMERICA
156 JEFFERSON AV
VANDERGRIFT PA

F LESLIE JACOBUS
SUN OIL CO
720 POMPTON AV
CEDAR GROVE NEW JERSEY

CLIFFORD S JAMES
IMPERIAL OIL LTD
475 VICTORIA AV S
HAMILTON ONT CANADA

LLEWELLYN M JAMES
WESTINGHOUSE ELEC CORP
LESTER PA

THOMAS B JAMES
PURE OIL COMPANY
620 EAST BROAD ST
COLUMBUS 15 OHIO

WM S JAMES
WM S JAMES & ASSOCIATES
4805 NORTH ADAMS RD
BIRMINGHAM MICH

STEWART JAMIESON
NATL GAS & OIL CO
9516 SO WINCHESTER AV
CHICAGO 43 ILL

JOSEPH A JAROSZ
1725 E RIDGEWOOD DR
SEVEN HILLS VILLAGE
CLEVELAND 31 OHIO

PARKER T JARVIS
SINCLAIR REFINING CO
361 BLENHEIM ROAD
COLUMBUS 14 OHIO

J D JENKINS
STANDARD OIL CO
BOX 1099
KANSAS CITY 41 MISSOURI

RICHARD H JENKS
REVERE COPPER & BRASS INC
ROME NEW YORK

PROF B H JENNINGS
DEPT OF MECH ENGRG
NORTHWESTERN UNIVERSITY
EVANSTON ILL

ALVIN A JERNANDER
K P MFG COMPANY
1226 LINDEN AV
MINNEAPOLIS 3 MINNESOTA

S VAN T JESTER JR
GULF OIL CORP
104 DORA AV
WALDWICK NEW JERSEY

JOSEPH THOMAS JOCKEL
SOCONY MOBIL OIL CO
582 LOCKHAVEN DR
RIVER VALE NEW JERSEY

WALLACE D JOHANSON
THE NORTHWEST PAPER CO
CLOQUET MINN

CLAIR M JOHNS
CLEVELAND WORM & GEAR
9224 HIGHLAND DR
BRECKSVILLE OHIO

ALONZO C JOHNSON
DAVIS CHEM CO DIV W R GRACE CO
128 BON AIR AV
BALTIMORE 25 MD

ARTHUR JOSEPH JOHNSON
T F HUDGINS & ASSOC INC
10918 LEANING ASH LANE
HOUSTON 24 TEXAS

CARL D JOHNSON
ERIE MINING CO
220 ELMWOOD RD
HOYT LAKES MINN

CLAUDE L JOHNSON
JESCO LUBRICANTS CO
1437 GENTRY P O BOX 7331
NORTH KANSAS CITY MO

CLYDE R JOHNSON
AM ELEC POWER SERV CORP LAB
105 FOREST PARK LANE
HUNTINGTON 5 WEST VIRGINIA

FLOYD W JOHNSON
STD OIL CO
2533 NORTH 111TH ST
MILWAUKEE 13 WIS

FRANK D JOHNSON
TRABON ENGINEERING CORP
28815 AURORA ROAD
SOLON OHIO

J M JOHNSON
REPUBLIC STEEL CORP
ROUTE 2
GADSDEN ALA

NELS G JOHNSON
RITTER ENGINEERING CO
6752 STONY ISLAND AV
CHICAGO 49 ILL

REUBEN C JOHNSON
ONAN DIV STUDEBAKER PACKARD CP
3720 ADAIR AV N
MINNEAPOLIS 22 MINNESOTA

RICHARD R JOHNSON
SOCONY MOBIL OIL CO INC
1441 VIA DEL MAR RD
SCHENECTADY 9 NEW YORK

ROBERT L JOHNSON
NATL AERO SPACE ADM
FAIRVIEW PARK 4503 W 224TH ST
CLEVELAND 26 OHIO

STEPHEN JOHNSON
BRIGGS FILTRATION CO
6406 LONG DR
HOUSTON TEXAS

WALTER A JOHNSON
ROCKWELL STD CP TRA & AXLE DIV
100 400 STREET
DETROIT 32 MICH

WALTER A JOHNSON
SOCONY MOBIL OIL CO
2809 MCKENZIE POINT RD
WAYZATA MINNESOTA

WARD W JOHNSON
ESSO STANDARD
516 RIDGELEY LANE
RICHMOND 29 VIRGINIA

H W JOHNSTON
STD OIL CO
1664 LEE ROAD
CLEVELAND HEIGHTS OHIO

WILLIAM R JOHNSTON
SINCLAIR REFINING CO
5339 FAIRWAY ROAD
KANSAS CITY 3 KANSAS

RAYMOND M JOLIE
SOCONY MOBIL OIL CO INC
RES & DEV LABORATORY
PAULSBORO NEW JERSEY

FRANK R JONES
BIG A CO LTD
135 JOHN ST N
HAMILTON ONT CANADA

LONNIE JONES
PHILLIPS PETROLEUM CO
1708 UTICA SQUARE
TULSA OKLAHOMA

R GLYNN JONES
924 DOUCET ST
SEPT ILES QUE CANADA

ROGER C JONES
62 LA SALLE ROAD
WEST HARTFORD 7 CONN

SAMUEL FREDERICK JONES
THE CLIFFE BARNBURGH RD
GOLDTHORPE N ROTHERHAM ENGLAND

THOMAS C JONES
JONES & LAUGHLIN STEEL CORP
3341 JENNINGS RD
CLEVELAND OHIO

PAUL L JORDAN
STD OIL CO
1230 AUDUBON PARKWAY
LOUISVILLE KY

ROBERT H JOSEPHSON
MECH RES DIV CLEVITE RES CTR
540 EAST 105TH ST
CLEVELAND 8 OHIO

THOMAS W JUSTICE
HERCULES POWDER CO
HOPEWELL VIRGINIA

JOHN KAFOURE
J & F DISTRIBUTING CO
845 W 60TH ST
INDIANAPOLIS 8 INDIANA

RICHARD O KAGEFF
FORD MOTOR CO
AMERICAN ROAD ROOM 157
DEARBORN MICH

ITSUO KAGEHIRA
MARUZEN OIL CO LTD CENT LAB
SHIMOTSUCHO KAISO GUN
WAKAYAMA KEN JAPAN

JAMES H KAHLKE
THE PURE OIL CO
200 EAST GOLF ROAD
PALATINE ILL

ROBERT A KAISER
THE STANDARD OIL CO
1818 MIDLAND BUILDING
CLEVELAND OHIO

ANTHONY F KAMINSKAS
CLEVELAND GRAPHITE BRONZE
17000 ST CLAIR AV
CLEVELAND 10 OHIO

ALEX WM KANOCZ
SHELL OIL CO
7352 READING ROAD
CINCINNATI 37 OHIO

L E KAMPMEIER
REF DEPT PHILLIPS PETRO CO
BARTLESVILLE OKLAHOMA

G L KARNER
NORDBERG MFG CO
1331 W BARNARD
MILWAUKEE 21 WIS

EVAN B KARNES
SUN OIL CO
5926 SOUTH MARSHFIELD
CHICAGO 36 ILL

ARTHUR P KARR
CONTINENTAL OIL CO
6935 VAN BUREN AV
HAMMOND IND

J W KASMARK
KOEHLER RUBBER SUPPLY CO
3865 CARNEGIE AV
CLEVELAND 15 OHIO

THEODORE G KAUFFMAN
E F HOUGHTON & CO
133 HARROW LANE
YOUNGSTOWN 11 OHIO

HOWARD N KAUFMAN
WESTINGHOUSE RES LABS
BEULAH ROAD CHURCHILL BORO
PITTSBURGH 35 PA

RAYMOND E KAUFMAN
U S NAVAL BOILER & TURBINE LAB
PHILA NAVAL BASE
PHILADELPHIA PA

B M KAYS
CITIES SERVICE OIL CO
HIAWATHA TRAILER COURT
HIAWATHA IOWA

FREDERICK A KAYS JR
TENNESSEE EASTMAN CO
KINGSPORT TENN

HUBERT E KAYE
ROLLWAY BEARING CO
541 SEYMOUR ST
SYRACUSE NEW YORK

HENRY W KAYSER
THE FALK CORP
3001 W CANAL ST
MILWAUKEE 8 WIS

RICHARD M KEARNS
OIL PROD CHEM CO DV NAL CH CO
402 WINNEBAG
PARK FOREST ILL

RAY H KEASLER
POST OFFICE DEPT
101 25 SAN JUAN
DALLAS 28 TEXAS

PATRICK JOSEPH KEATING JR
TEXACO INC RESEARCH CENTER
P O BOX 509
BEACON NEW YORK

ROBERT H KEATON
KAISER STEEL CORP
P O BOX 217
FONTANA CAL

MORRIS J KEENAN
STD OIL CO IND
3423 SOUTH IVANHOE
DENVER COLORADO

FRANCIS M KEENEN
ESSO STD OIL CO
PARKWAY VILLAGE APT 1 A
CRANFORD NEW JERSEY

WM H KEIER
FISKE BROS REFINING CO
403 15TH ST N E
CANTON 4 OHIO

OWEN I KEIL
KEIL CHEMICAL CO
315 N LEAVITT ST
CHICAGO 12 ILL

A C KEISER JR
TEXACO INC
P O BOX 1722
ATLANTA 1 GA

R W KELEHER
WYMAN GORDON
146TH & WOOD
HARVEY ILL

GEORGE KELLER
KEYSTONE LUBRICATING CO
522 E HELLMAN AV
MONTEREY PARK CAL

HOWARD B KELLER
HARTFORD STEEL BALL CO
12 JEFFERSON AV
WEST HARTFORD 6 CONN

ROLAND J KELLER
SHELL OIL CO OF CANADA
700 MOHAWK RD E APT 303
HAMILTON ONT CANADA

GEORGE E KELLIS
SINCLAIR REFINING CO
600 FIFTH AV
NEW YORK 20 NEW YORK

EDWARD S KELLY
THE BUDD CO
12141 CHARLEVOIX AV
DETROIT 15 MICH

FRANK C KELLY
INTERNATIONAL NICKEL CO INC
HUNTINGTON WORKS
HUNTINGTON WEST VIRGINIA

JOSEPH L KELLY
HILLIARD CORP
611 BESSEMER BLDG
PITTSBURGH 22 PA

ROBERT L KELLY
TIDEWATER OIL CO
660 MADISON AV
NEW YORK 21 NEW YORK

T J KELLY
UNITED STATES STEEL CORP
P O BOX 1391
UNIONTOWN PA

HAROLD R KEMMERER
SHELL OIL COMPANY
50 W 50TH ST
NEW YORK 20 NEW YORK

WOLFGANG A KEMPFF
NATL SEAL DIV FED MOGUL
2218 ENSENADA WAY
SAN MATEO CAL

AARON T KENDRICK JR
DANLY MACHINE SPEC INC
2100 SOUTH 52ND
CICERO 50 ILL

REED H KENNARD
TULSA PRODS DIV VICKERS
7314 E MARSHALL ST
TULSA 15 OKLA

G D KENNEDY
PEACOCK BROTHERS
1667 EGLINTON AV
TORONTO ONT CANADA

JOSEPH F KENNELLY
MAGIE BROS OIL CO
9101 FULLERTON AV
FRANKLIN PARK ILL

GEORGE E KENT JR
GULF OIL CORP
P O BOX 385
WESTBORO MASS

GEORGE F KERBY
CITIES SERVICE OIL CO
503 COKESBURG LANE
RICHMOND VIRGINIA

H CONRAD KERN
BETHLEHEM STEEL CO
273 SOUTH MAIN ST
COOPERSBURG PA

RAYMOND T KERN JR
GULF RESEARCH & DEVELOPMENT CO
P O BOX 2038
PITTSBURGH 30 PA

J R KERRUISH JR
ESSO STD OIL CO
66 THOMPSON ST
HAMDEN 14 CONN

WILLIAM R KETTERER
WARNER & SWASEY CO
15614 MUNN AV
CLEVELAND 11 OHIO

CLIFFORD W KEWLEY
SINCLAIR REFINING CO
550 BARKLEY ROAD
SHAWNEE MISSION KANS

IKE L KIBBE
WAYNE PUMP CO DV SYM WAYNE COR
201 HOLLAND AV
SALISBURY MARYLAND

HAROLD KIDD
TIDEWATER OIL CANADA LTD
119 HERON DR P O BOX 220
AJAX ONT CANADA

CHARLES N KIEFER
TEXACO INC
1700 STEWART AV
ST PAUL MINNESOTA

WM C KIEFER
BEL RAY COMPANY INC
FARMINGDALE NEW JERSEY

WILLIAM F KIGERL
TEXACO INC
111 CEDAR ROAD
SEVERNA PARK MD

JAMES E KILLIAN
METAL LUBRICANTS CO
1412 ISABELLA ST
WILMETTE ILL

DAVID R KIMBER
THE LUBRIZOL CORPORATION
215 E RIDGEWOOD AV
RIDGEWOOD NEW JERSEY

GUTHRIE C KIMBROUGH
BATTENFELD GREASE & OIL CORP
3148 ROANOKE ROAD
KANSAS CITY 8 MO

HANS JOACHIM KINDLER
MINERALOWERKE ALBRECHT & CO
GLOCKENGIESSERWALL
HAMBURG 2 4 GERMANY

DOUGLAS R KINCAID
SHELL OIL COMPANY
8020 NEW HAMPSHIRE AV
SILVER SPRING MD

DONALD F KING SR
LUBRICATION ENGINEERS
155 RIVER ROAD
TOPSFIELD MASS

G S KING
THE STD OIL CO
930 TENNESSEE AV
CINCINNATI 29 OHIO

SELDON J KING
VAN DEVANTER ENGRG CO
3974 DELMAR BOULEVARD
ST LOUIS 8 MISSOURI

EDWARD P KINGSBURY
THE ALLOYD CORP
60 HAY ST
NEWBURY MASS

JOHN D KINSEY
FARVAL CORP
141 W JACKSON BLVD
CHICAGO 4 ILL

E M KIPP
SUN OIL CO RES & DEVELOPMENT
MARCUS HOOK PA

JOSEPH KIRK
TIMKEN DETROIT AXLE
8448 COLONIAL LANE
DEARBORN 6 MICH

JAMES E KIRSCHNER
WHEELING STEEL CORP
BENWOOD W VA

SAUL W KLASKY
G WHITFIELD RICHARDS
1732 36 CARLTON ST
PHILADELPHIA 3 PA

ARTHUR KLASS
BOWSER INC
29 ROSALIND ROAD
LAKEWOOD NEW JERSEY

ROBERT V KLINT
GENERAL ELECTRIC CO RES LAB
P O BOX 1088
SCHENECTADY NEW YORK

M P KLEINHOLZ
SINCLAIR RESEARCH LABS
400 E SIBLEY BLVD
HARVEY ILL

DR E N KLEMGARD
CONSULTING LUB ENGINEER
RT 2 BOX 65
PULLMAN WASHINGTON

GARY H KLING
LE TOURNEAU WESTINGHOUSE CO
2301 NE ADAMS ST
PEORIA ILL

FRANK KLINGENSMITH
COPPERWELD STEEL CO
MAHONING AV
WARREN OHIO

WALTER KLOC
CHEVROLET FOUNDRY
33 BRAUMCROFT LANE
SNYDER 26 NEW YORK

FRED N KLOOSTER
FAMOUS LUBRICANTS INC
7318 WEST 119TH PLACE
PALOS HEIGHTS ILL

JOHN A KLOPP
REILLY WHITEMAN WALTON CO
P O BOX 188
CONSHOHOCKEN PA

HERMAN H KLUG
SCOTT PAPER COMPANY
MARKET ST
CHESTER PA

ROY L KLUMB
JOS SCHLITZ BREWING CO
235 W GALENA ST
MILWAUKEE 12 WIS

ELWOOD F KNAPP
FIRE CO INC SUB AERO EQUIP COR
3695 BROADWAY
BUFFALO 25 NEW YORK

ROBERT P KLENNER
SHELL OIL CO
20736 ERIE ROAD
ROCKY RIVER 16 OHIO

RICHARD H KNOWE
SHELL OIL CO
907 MONROE AV
ROCHESTER NEW YORK

RICHARD E KNOWLTON
STANDARD OIL CO
MIDLAND BUILDING
CLEVELAND 15 OHIO

LEE H KNOX
CELANESE FIBERS CO
P O BOX 1113
ROME GEORGIA

ARMIN S KOCH
SPERRY GYROSCOPE CO
1P39
GREAT NECK NEW YORK

CLIFFORD KOCH
STANDARD OIL CO
4850 EAST 49TH
CLEVELAND OHIO

JOHN E KOCH JR
CELANESE CORP OF AMERICA
MORRIS COURT
SUMMIT NEW JERSEY

JOHN H KOESTER
GRANITE CITY STEEL CO
9730 COLONY DRIVE
ST LOUIS 15 MISSOURI

MELVIN KOFMAN
PARAGON OIL CO INC
2100 HUNTERS POINT AV
LONG ISLAND CITY 1 NEW YORK

FRANK J KOKAS
TENN GAS PIPELINE CO
5510 NORTH RICE AV
HOUSTON 36 TEXAS

FRANK J KOLANO
WESTINGHOUSE ELEC CORP RES LAB
BEULAH RD CHURCHILL BORO
PITTSBURGH 35 PA

IVAN S KOLARIK
53 ROSEMONT AV
EAST PATERSON NEW JERSEY

CARL E KOLDA
ALLIS CHALMERS
7710 EAGLE ST
WAUWATOSA 13 WIS

FRANCIS H KOLDE
THE CHAMPION PAPER & FIBRE CO
601 N B ST
HAMILTON OHIO

WILLIAM A KOLINGER
MOBIL OIL CO INC
59 EAST VAN BUREN ST
CHICAGO ILL

THOMAS J KOON
AMERICAN OIL CO
721 GARDEN CITY DRIVE
MONROEVILLE PA

GEORGE KORKALA
SUN OIL COMPANY
1910 RUSSELL ST
BALTIMORE 30 MD

JAMES E KORN
CANFIELD OIL CO
3216 EAST 55TH ST
CLEVELAND 17 OHIO

HARRY ROBERT KOSES
LINCOLN ENGRG CO OF CALIF
3033 SAN PABLO AV
BERKELEY 2 CAL

JULES P KOVACS
PUROLATOR PRODUCTS INC
970 NEW BRUNSWICK AV
RAHWAY NEW JERSEY

JOS G KOVAL JR
SINCLAIR REFINING CO
10228 S FAIRFIELD AV
CHICAGO 43 ILL

WILBUR J KOZAK
C H CLARK OIL CO
6610 THEOTA AV
PARMA 29 OHIO

E J KRABACHER
THE CINCINNATI MILL MACH CO
MARBURG AV
CINCINNATI 9 OHIO

WILLIAM C KRANE
DOW CORNING SILICONS LTD
5582 DECARIE BOULEVARD
MONTREAL QUE CANADA

HERMAN KRAMER
CENTRAL BUREAU
POSTBUS 182
ROTTERDAM HOLLAND

WM EDW KRAMER
GULF RES & DEV CO
604 WIBLE RUN ROAD
PITTSBURGH 31 PA

CHAS I KRAUS
ALEMITE CO OF MINN
1226 HARMON PLACE
MINNEAPOLIS 3 MINN

ROBERT A KRAUS
REPUBLIC STEEL CORP
549 BELVEDERE N E
WARREN OHIO

PETER M KRAWCHUK
IMPERIAL OIL LTD
111 ST CLAIR AV W
TORONTO ONT CANADA

LEONARD J KRAWCZENSKI
SHELL OIL CO
1207 STEENROD AV
WHEELING W VA

J KRAWETZ
PHOENIX CHEMICAL LAB INC
3953 SHAKESPEARE
CHICAGO 47 ILL

JOHN H KRESTAN
BATTENFELD GREASE & OIL CO
P O BOX 144
NORTH TONAWANDA NEW YORK

W J KRIBS
CITIES SERVICE OIL CO LTD
170 UNIVERSITY AV
TORONTO ONT CANADA

STANTON S KRIEG
JEFFREY MFG CO
1688 E LAKEVIEW AV
COLUMBUS 24 OHIO

JOHN KRIESMER
ARABIAN AMERICAN OIL CO
P O BOX 1534
DHAHRAN SAUDI ARABIA

FRIEDRICH J KROEG
CALTEX OIL GERMANY GMBH
SCHMIEDESTR 26
HANNOVER GERMANY

HERBERT C KRUGER
THE F D JOHNSON CO
24408 EFFINGHAM BLVD
CLEVELAND 17 OHIO

FRED KRUPIN
GENERAL ANILINE & FILM CORP
568 GRAND ST
NEW YORK 2 NEW YORK

EDWARD A KRUSZYNSKI
LAFRANCE MFG CO
8449 51 WABASH
ST LOUIS 34 MISSOURI

EDWARD A KRYGSMAN
AMOCO AUSTRALIA PTY LTD
36 INVERALLAN AV
PYMBLE SYDNEY NSW AUSTRALIA

P M KU
SOUTHWEST RES INSTITUTE
8500 CULEBRA ROAD
SAN ANTONIO TEXAS

EUGENE R KUCH
GARDNER DENVER COMPANY
SOUTH FRONT ST
QUINCY ILLINOIS

WILLIAM C KUHLKE
SHELL OIL CO
957 GREENBRIAR DR R D 4
NORRISTOWN PA

O F KUHLMAN
FISKE BROS REFINING CO
BOX 444
ELMORE OHIO

DOUGLAS A KUHNA
J N FAUVER CO INC
49 WEST HANCOCK
DETROIT MICH

I KUKIN
SONNEBORN CHEM & REFINING CO
HANCOX AV
BELLEVILLE 9 NEW JERSEY

ERNEST A KUNTZE
SINCLAIR REFINING CO
1231 GRIGNOR ST
GREEN BAY WIS

JAMES A KYLE
SINCLAIR REFINING CO
BOX 248 SOUTH SALT LAKE
SALT LAKE CITY UTAH

HUGH A LADNER
TEXACO INC
1 ROBIN LANE
WESTBORO MASS

JOHN P LAFORGE
MOBIL OIL CO
754 IRWINDALE
WEST COVINA CAL

C S LAGERGREN
SINCLAIR REF CO
P O BOX 176
GRANVILLE OHIO

ARTHUR J LAKE
SUPERTEST PETROLEUM
660 RICHMOND ST
LONDON ONT CANADA

THORNTON LAKE
F D JOHNSON CO
28815 AURORA RD
SOLON OHIO

WILFORD P LAKIN
UNION OIL CO OF CAL
155 MIRAMONTE DR
FULLERTON CAL

EDWARD R LAMBERT
FEDERAL AVIATION AGENCY
7328 BOOTH
PRAIRIE VILLAGE KANSAS

HARRY F LAMBERT
J A MOODY CO
CHETWYND APTS APT 907
ROSEMONT PA

FRANK LAMBERTUS
AMER BEAR CORP
429 S HARDING ST
INDIANAPOLIS INDIANA

C M LARSON CONSULTING ENGR
LARCLIFF
55 TAYMIL ROAD
NEW ROCHELLE NEW YORK

BERT J LAMPORT
UNITED ENG & FOY CO
948 FT DUQUESNE BLVD
PITTSBURGH 22 PA

D W LANDACRE
PURE OIL CO
224 MAPLE ST
BRIDGEPORT W VA

ERWIN LANDAU
ASIATIC PETROLEUM CORP
1 ROCKEFELLER PLAZA
NEW YORK 20 NEW YORK

JAMES LANDES
ELAN PROD CO A DV E LILLY & CO
640 SOUTH ALABAMA
INDIANAPOLIS 6 INDIANA

WARREN C LANDIS
SHELL OIL CO INC
800 WELLINGTON RD STONLEIGH
BALTIMORE 12 MD

THEODORE C LARSON
CALIF OIL CO
57 JENSEN AV
FORDS NEW JERSEY

HORACE G LANE
SINCLAIR REF CO
P O BOX 1710
ATLANTA 1 GEORGIA

HENRY J LANG
ACHESON COLLOIDS CO
902 ROLLING ROCK ROAD
PITTSBURGH 34 PA

M L LANGWORTHY
CALTEX SERVICE CO
380 MADISON AV
NEW YORK 17 NEW YORK

THOMAS O LANPHIER
HERCULES PACKING CO
2832 CHAMBERLAIN RD
AKRON 13 OHIO

DONALD A LANSING
ROBERTSON MFG CO
621 GREENWAY AV
TRENTON 8 N J

GEORGE C LA PORTE
DRYDEN OIL CO
202 MEADOWVALE RD
LUTHERVILLE MD

ARTHUR R LAROCQUE
SHELL OIL COMPANY
BOX G WEST END P O
PORTLAND MAINE

HENRY M LARSEN
GMC TRUCK & COACH
4518 S SHORE DR
PONTIAC MICHIGAN

ALBIN E LARSON
MIDLAND COOPERATIVES INC
56 HIGHWAY 100 N E
MINNEAPOLIS 21 MINNESOTA

WALTER R LASTER
BORG WARNER CORP
RESEARCH CENTER
DES PLAINES ILL

PHIL E LATTERELL
SHELL OIL CO
315 DERBY AV
OAKLAND 1 CAL

WILLIAM D LAUERMAN JR
PENOLA OIL CO
115 ROBIN HILL DRIVE
NAPERVILLE ILL

ALLAN A LAURIN
NEW YORK CENTRAL SYSTEM
577 E 152ND ST
CLEVELAND 10 OHIO

CLAUDE A LAVERDUE
TIDEWATER OIL CO
4987 ARDENNES
MONTREAL N QUE CANADA

MELVIN T LAVIK
MIDWEST RES INST
425 VOLKER BLVD
KANSAS CITY MO

TOM C LAW
AMERICAN OIL CO
1805 WALNUT ST
PHILADELPHIA PA

JOSEPH V LAWLER
GEN ELEC CO
2008 WEST FALLS
KENNEWICK WASH

CLEMENT R LAWRENCE
U S STEEL CORP
1740 CATHELL ROAD
PITTSBURGH 36 PA

JOHN C LAWRENCE
SKF INDUSTRIES
FRONT & ERIE
PHILADELPHIA PA

JOHN R LAWRENCE
F D JOHNSON CO
99 AUDUBON DRIVE
SNYDER 26 NEW YORK

WILLIAM C LAWRENCE
D A STUART OIL CO LTD
4660 DOVERDELL DRIVE
PITTSBURGH 36 PA

M L LAZEAR
WHEELING STEEL CORP
WHEELING W VA

JAMES R LEAHY
MINNESOTA MINING & MFG
800 BUSH AV
ST PAUL MINNESOTA

EDW R LEARNED
LEARNED & FUREY
2315 W VLEIT
MILWAUKEE WIS

R P LEE
CONSUMERS COOP ASSOC
P O BOX 7305
KANSAS CITY 16 MO

RALPH E LEE JR
GEN ELEC CO
1062 PALAZINI DRIVE
SCHENECTADY 3 NEW YORK

GUY H LEFFEL
D A STUART OIL CO LTD
1021 LIMESTONE ST
SPRINGFIELD OHIO

LOUIS E LEFLAMME
WHITIN MACHINE WKS
MAIN ST
WHITINSVILLE MASS

ROGER LEGAULT
DOMINION BRIDGE CO LTD
P O BOX 280
MONTREAL QUE CANADA

GUY E LEIBY
JACOBS AIRCRAFT ENGINE CO
R F D
PENNSBURG PA

J CLARK LEIS
U S STEEL CORP
CLAIRTON WKS
CLAIRTON PA

P JOSEPH LEMAISTRE
TEXACO INC
41 PINE LANE ROUTE 200
PORTLAND MAINE

J H C LEMEILLEUR
TEXACO CANADA LTD
940 COTE DE LIESSE RD
MONTREAL QUE CANADA

ELMER A LEMIRE
PENNZOIL OIL CO
1630 W OLYMPIC BLVD
LOS ANGELES 15 CAL

JOHN A LEMMENES
CENTRAL PETROLEUM CO
807 EAST FRANKLIN
WAUPUN WIS

DON C LEMMON
GENERAL ELEC CO
1100 WESTERN AV
LYNN MASS

JOS M LENDWAY
SHELL OIL CO
10565 VERNON AV
HUNTINGTON WOODS MICH

WILLMOT W LE ROY
VICKERS INC
1434 ALINE DR
GROSSE POINTE WOODS MICH

RICHARD L LESLIE
214 FISHER RD
GROSSE POINTE 30 MICH

JULIAN LE SIRE
O L KING & CO
640 GILMAN ST
BERKELEY 10 CAL

LEONARD LETO
NEW DEPARTURE DIV GMC
1594 NORTH AV
BRIDGEPORT 4 CONN

G A LEVASSER
TROPIC OIL CO
P O BOX 44 LITTLE RIVER STA
MIAMI FLA

LAWRENCE C LEVY
NATL REF CO
2080 TEMBLETHURST DR
SOUTH EUCLID 21 OHIO

ALFRED LEWIS
ALPHA MOLYKOTE CORP
65 HARVARD AV
STAMFORD CONN

CHARLES T LEWIS
REPUBLIC STEEL CORP
REPUBLIC BLDG
CLEVELAND 1 OHIO

C E LEWIS
AMERICAN CAST IRON PIPE CO
2930 NORTH 16TH ST
BIRMINGHAM 2 ALABAMA

HENRY D LEWIS
CONSOL EDISON CO OF N Y INC
4 IRVING PLACE
NEW YORK 3 NEW YORK

JAMES H LEWIS
U S STEEL CORP
CLAIRTON WKS
CLAIRTON PA

GRAYDON LEY
ANACONDA ALUMINUM CO
R F D 5
TERRE HAUTE IND

RALPH M LEY
SHELL OIL CO
BOX 773 ROUTE 4
WAUKESHA WIS

FRANK A LEYDA
LEYDA OIL & CHEM CO
12603 CERISE AV
HAWTHORNE CAL

G LIBERGE
CONDAT ET CIE
117 RUE DE GERLAND
LYON RHONE FRANCE

OTTO F LICHT
AMERICAN OIL CO
2ND & MAIN STS P O BOX 4339
JACKSONVILLE 1 FLA

DARYL DON LIEBERMAN
PEMACO INCORPORATED
5989 DISTRICT BLVD
LOS ANGELES 22 CAL

H J LIEHE
AMERICAN OIL CO
P O BOX 431
WHITING IND

ELVIN B LIEN
UNION OIL CO OF CALIF
5885 HOLLIS ST
EMERYVILLE CAL

ROBERT J LIGGETT
ELK REF CO
P O BOX 1033
CHARLESTON 24 WEST VIRGINIA

REUBEN PATTON LIGHTFOOT JR
CONVAIR
6408 KIRKWOOD RD
FORT WORTH TEXAS

C ARVID LILLMARS
PETROLEUM EQUIP CO
3117 N BROAD ST
PHILADELPHIA PA

A W LINDERT
AMERICAN OIL CO
RESEARCH DEPARTMENT
WHITING IND

ROBERT H LINDQUIST
DURKEE ATWOOD CO
215 N E 7TH ST
MINNEAPOLIS 13 MINN

WILLIAM ROBERT LINDQUIST
ALDRIDGE IND OILS INC
10669 WOODVIEW BLVD
CLEVELAND 30 OHIO

W B LININGTON
RICHFIELD OIL CORP
417 MONTGOMERY ST
SAN FRANCISCO 4 CAL

CURTIS LINKE
ALLIANCE MANUFACTURING CO
LAKE PARK BLVD
ALLIANCE OHIO

D C LIONBERGER JR
TENN EASTMAN CORP
KINGSPORT TENN

J G LIPPERT
CASTROL LIMITED
2 LOUISIANA AV
BRONXVILLE 8 NEW YORK

ALVIN H LIPTON
NATL CASH REGISTER CO
228 NIAGARA AV APT 17
DAYTON 5 OHIO

S J LITTEN
SUN OIL CO
WHEELING W VA

ROBT B LITTLE
332 HOMESTEAD RD
WAYNE PA

L P LIVINGSTON
HUMBLE OIL & REFINING CO
BOX 13224
DALLAS TEXAS

LESTER E LOCKE JR
BATTENFELD GREASE & OIL CO N Y
P O BOX 144 ERIE AV
NORTH TONAWANDA NEW YORK

A L LOCKHART
HYDROTEX INDUSTRIES
4333 N CENTRAL EXPWY
DALLAS TEXAS

ALFRED M LOEB
FRANKLIN INST LAB
4376 GARFIELD LANE
TREVOSE PA

CARL W LOEB JR
LUBRI CASE INC
137 EAST 57TH ST
NEW YORK 22 NEW YORK

MAURICE F LOEFFEL
MACCO PRODUCTS CO
11 SOUTH DONALD AV
ARLINGTON HEIGHTS ILL

EDWARD H LOESER
CHRYS CORP CHEM RES DEPT 931
P O BOX 1118
DETROIT 31 MICH

E A LOEW
STD OIL CO OHIO
2715 COVENTRY ROAD
COLUMBUS 21 OHIO

JAMES O LOFSTROM
STD OIL COMPANY N J
30 ROCKEFELLER PLAZA
NEW YORK 20 NEW YORK

ROBERT L LOGELIN
SINCLAIR REFINING CO
18432 WESTERN AV
HOMEWOOD ILL

JOHN H LOHMAN
SHELL OIL CO
83 MORGAN AV APT 6 J
STAMFORD CONN

CALVIN F LONG
THE ELCO LUBRICANT CORP
410 BILTMORE DRIVE
INKSTER MICH

WILLIAM G LONG
CR STD VACCUM OIL CO
P O BOX 189
BANGKOK THAILAND

JOHN LONGAZO
U S STEEL CO
1071 HARRISON BLVD
GARY IND

MALCOLM LONGMORE
TEXACO INC
433 SHERWOOD ROAD
LA GRANGE ILL

JOSEPH LONGSON
AMERICAN BRAKE SHOE CO
VALLEY ROAD
MAHWAH NEW JERSEY

LELAND LOOMIS
STD OIL DIV OF AMERICAN OIL CO
14473 ROBINWOOD DRIVE
PLYMOUTH MICH

CHRIST A LORENZEN
SHELL OIL COMPANY
600 SHELL BLDG
NEW ORLEANS LA

D B LOVING
HUMBLE OIL & REFINING CO
8253 GARFIELD ST
HOUSTON 29 TEXAS

L E LOVITT
SOCONY MOBIL OIL CO
337 JONQUILL AV
PITTSBURGH 16 PA

HOWARD P LOWE
E F HOUGHTON & CO
BOX 113 STATION D
TORONTO 9 ONT CANADA

JAMES L LUBKIN
AM MACH & FOUN CO CEN RES LAB
P O BOX 889
STAMFORD CONN

GILBERT K LUDWIG
CONTINENTAL OIL CO
BOX 2197
HOUSTON 1 TEXAS

S GROVE LUGAR
W M STILLWELL CO
1617 PA BLVD ROOM 844
PHILADELPHIA 3 PA

ROMAN J LUMME
NATL REFINING CO
3216 SOUTH 53RD ST
MILWAUKEE 19 WIS

JOSEPH T LUNDQUIST
LUNDQUIST LUBRICATING CO
2353 WEST 111TH ST
CHICAGO 43 ILL

BORGE LUNN
21 AURORAVEJ VANLOSE
COPENHAGEN DENMARK

GILBERT M LUNZ
LINCOLN EQUIPMENT CO
3057 NORTH 35TH ST
MILWAUKEE 10 WIS

WILLIAM LUTHI
ELCO LUBRICANT CORP
JENNINGS ROAD
CLEVELAND 9 OHIO

JOSEPH D LYKINS
WHEELING STEEL CORP
WHEELING W VA

JOHN P LYNCH
TIDEWATER OIL CO
717 TAFT AV N
PLAINFIELD NEW JERSEY

WILLIAM H LYON
ROLLWAY BEARING CO INC
541 SEYMOUR ST
SYRACUSE NEW YORK

DONALD RAY MABON
E I DU PONT DE NEMOURS
1116 MIDLAND BUILDING
CLEVELAND 15 OHIO

EDWARD N MACALLISTER
ESSO STD OIL CO
19 OAKLEY AV
SUMMIT NEW JERSEY

ROBERT J MACDONALD
CLEVITE CORPORATION
540 EAST 105TH ST
CLEVELAND 8 OHIO

AMOS J MACDUFF
RUST LICK INC
755 BOYLSTON ST
BOSTON 16 MASS

ROBERT A MACGILLIS
ALEMITE CO
BOX 38
CANFIELD OHIO

JOHN L MACLEOD
TEXACO CANADA LTD
1425 MOUNTAIN ST
MONTREAL 25 QUE CANADA

ALEX MACRAE
APCO INDUSTRIES LTD
10 INDUSTRIAL ST
LEASIDE TORONTO ONT CANADA

JOHN Q MAGIE
MAGIE BROS OIL CO
9101 FULLERTON AV
FRANKLIN PARK ILL

PETER M MAGIE
BEMOL INC
40 HILLCREST CIR
WATERTOWN 72 MASS

WILLIAM A MAGIE
MAGIE BROS OIL CO
9101 FULLERTON AV
FRANKLIN PARK ILL

WILLIAM A MAGIE III
MAGIE BROS OIL CO
2502 OAK ST
NORTHBROOK ILL

JOSEPH C MAGOWAN
MASTER LUBRICANTS CO
325 MERION ROAD
MERION STATION PA

THOMAS G MAGUIRE
E F HOUGHTON & COMPANY
303 W LEHIGH AV
PHILADELPHIA 33 PA

WM J MAGUIRE
SUN OIL COMPANY
106 SOUTH 16TH ST
PHILADELPHIA 3 PA

ROBERT J MAHAFFAY
THE CHEK CHART CORP
222 WEST ADAMS ST RM 1590
CHICAGO 5 ILL

HENRY E MAHNCKE
SKF INDUSTRIES INC
FRONT ST & ERIE AV
PHILADELPHIA 32 PA

GLEN M MAJORS
INGERSOLL RAND COMPANY
PAINTED POST NEW YORK

ALEX MALLO
JOSEPH T RYERSON
16TH & ROCKWELL
CHICAGO 8 ILL

W R MALLORY
ROYAL MANUFACTURING CO INC
320 SOUTH 25TH WEST AV
TULSA OKLA

JAMES EDWARD MALLOY
MOBIL OIL CO
12 DEEPWOOD DRIVE
WOLCOTT 16 CONN

WALLACE D MALMSTEDT
INTERNATIONAL MILLING CO
1200 INVESTORS BUILDING
MINNEAPOLIS MINNESOTA

W H MANDY
TEXACO INC
154 SPRING GROVE ROAD
PITTSBURGH 35 PA

STANLEY B MANES
RICHFIELD OIL CORP
1317 YAMHILL
MCMINNVILLE OREGON

SAMUEL E MANILYCH
AMER OIL & SUPPLY CO
70 NORMAN PLACE
TENAFLY NEW JERSEY

F E MANLEY JR
RAMSEY MACHINE CORP
P O BOX 14263
HOUSTON 21 TEXAS

LEO W MANLEY
SOCONY MOBIL OIL CO INC
RESEARCH & DEV LAB
PAULSBORO NEW JERSEY

WILLIAM MANUS
ATLANTIC REFINING CO
260 SOUTH BROAD ST
PHILADELPHIA PA

WM H MANN
CAN D A STUART OIL CO LTD
P O BOX 430
SCARBOROUGH ONT CANADA

KENNETH F MANS
D X SUNRAY OIL CO
BOX 381
TULSA OKLA

ALLAN A MANTEUFFEL
PURE OIL CO
630 WOODLAND DRIVE
CRYSTAL LAKE ILL

LEON MARGOLIS
A MARGOLIS & SONS
1504 10 ATLANTIC AV
BROOKLYN 16 NEW YORK

DAN MARIEN
ARCHER DANIELS MIDLAND CO
2191 WEST 110TH ST
CLEVELAND 2 OHIO

DOUGLAS A MARKEY
R T VANDERBILT CO
5966 E 24TH PLACE
TULSA 14 OKLA

EDW L MARKLE
SHELL OIL CO
290 LARKIN ST
BUFFALO 10 NEW YORK

E R MARKS
RICHFIELD OIL CORP
10192 DEWEY DR
GARDEN GROVE CAL

CHARLES W MARLOW
ESSO STD DIV HUM OIL & REF CO
827 MAGIE AV
ELIZABETH NEW JERSEY

E A MARQUETTE
STD OIL CO OHIO
2130 MICKLETHWAITE RD
PORTSMOUTH OHIO

HOWARD R MARR
THE PENNZOIL CO
2826 ROGERS ROAD
YOUNGSTOWN OHIO

ALFRED MARSH
BP AUSTRALIA LTD
131 QUEEN ST
MELBOURNE VICTORIA AUSTRALIA

A O MARSH JR
AMER SMELTING & REFINING CO
514 CRANDALL BLVD
SALT LAKE CITY UTAH

J K MARSHALL
CANADIAN OIL COS LTD
350 ST GEORGE ST
MONCTON N B CANADA

ROY M MARSHALL
AMER BRAKE SHOE CO NAT BEAR DV
4930 MANCHESTER AV
ST LOUIS 10 MISSOURI

THOMAS A MARSHALL
STEEL CO OF CANADA LTD
WILCOX
HAMILTON ONT CANADA

WILLIAM T MARSHALL
CHEMSTRAND CORP
P O BOX 1507
PENSACOLA FLORIDA

HOWARD A MARTEN
HOWARD A MARTEN CO
124 MANVILLE ROAD
SCARBOROUGH ONT CANADA

CHARLES W MARTIN
CHAMPLIN OIL & REFINING CO
1622 WEST MAINE
ENID OKLA

CLIFFORD A MARTIN
CR JOHN SWIFT CHEMICAL CO
BOX 307
CANTON CONN

DENNIS TELL MARTIN
UNION CARBIDE NUCLEAR
114 PEMBROKE RD
OAK RIDGE TENN

FRANCIS ALFRED MARTIN
ESSO STANDARD OIL S A
109 ABERCROMBY ST
PT OF SPAIN TRINIDAD W INDIES

FRANK J MARTIN
BETHLEHEM STEEL CORP
1741 BROOKVIEW ROAD
BALTIMORE 15 MARYLAND

JAMES S MARTIN
F E ANDERSON OIL CO
365 HIGH RIDGE ROAD
FAIRFIELD CONN

JOHN A MARTIN
SHELL OIL COMPANY
600 SHELL BUILDING
NEW ORLEANS LOUISIANA

JOHN J MARTIN
PURE OIL CO
609 S LOMBARD AV
OAK PARK ILL

VEYNE V MASON
INDEPENDENT RESEARCH
413 S ORANGE GROVE AV
LOS ANGELES 36 CAL

WALTER JOHN MASON
256 HAMILTON ROAD
CORNING NEW YORK

HYMAN DAVE MASSIN
TEXACO INC RESEARCH & TECH DEP
P O BOX 1499
PORT ARTHUR TEXAS

JOHN A MATHE
E F HOUGHTON & CO
2949 BANNER ROAD
WILLOW GROVE PA

ROBERT H MATHER
INTERNATIONAL HARVESTER
20 E BALBOA DRIVE
TEMPE ARIZONA

JOHN F MATLACK
SUN OIL CO
611 SANTURCE AV
CORAL GABLES FLORIDA

EDWARD T MATRAS
FARMERS UNION CEN EX
840 5TH AV S
SOUTH ST PAUL MINNESOTA

IRVING L MATSON
TEXACO INC
512 HANCOCK AV
HANCOCK MICHIGAN

THOMAS H MATTHEWS
WALKERS CENTURY OILS LTD
CENTURY WKS
HANLEY STOKE ON TRENT ENGLAND

ROBERT D MAUGER
FIRESTONE TIRE & RUBBER
325 N 7TH AV
ROYERSFORD PA

FRANK P MAURO
GULF OIL CORP
P O BOX 1000
FORT WORTH TEXAS

D B MAVER JR
SHERRILL OIL COMPANY
FOOT OF CLUBB ST
PENSACOLA FLORIDA

JERROLD F MAXWELL
E F HOUGHTON & CO
3214 N BROAD ST
PHILADELPHIA 40 PA

CLAUDE H MAY
WALKER MANUFACTURING CO
RACINE WIS

CLIFFORD HORTON MAY
BRIGGS FILTRATION CO
RIVER ROAD
WASHINGTON 16 D C

EDWIN M MAY
BOWSER INC
1825 ELEVADO
ARCADIA CAL

JAMES DAYTON MAY JR
TIONA PETROLEUM CO
6415 CRESCENT BLVD
PENNSAUKEN NEW JERSEY

ROBERT L MAY
SINCLAIR REFINING CO
600 FIFTH AV
NEW YORK 20 NEW YORK

WM R MAYHEW
MAYHEW PRODS CO
435 SOUTH OAKLAND ST
PASADENA CAL

H A MAYOR JR
SOUTHWEST GREASE & OIL CO
220 W WATERMAN ST
WICHITA 2 KANSAS

NICHOLAS MAZURANE
ALLIS CHALMERS
15418 HONORE
HARVEY ILL

RAY MCBRIAN
DENVER RIO GRANDE W RR CO
WEST 6TH & OSAGE BURNHAM LABS
DENVER 4 COLO

ROBERT B MCBRIDE
GENERAL ELECTRIC CO
37 PINEWOODS AV
TROY NEW YORK

JAMES T MCCABE
CLIMAX MOLYBDENUM CO
320 FAIRFAX DRIVE
BIRMINGHAM MICH

H M MCCAIN
GULF OIL CORP
1515 LOCUST ST
PHILADELPHIA 2 PA

EDWIN J MCCANDLISH
BROCKWAY GLASS CO INC PLANT 2
BROCKWAY PA

O G MCCANDLESS
ARMCO STEEL CORP
BUTLER PA

WM A MCCARTHY
TIDEWATER OIL CO
1035 BLOOMFIELD ST
HOBOKEN NEW JERSEY

BERNARD Y MCCARTY
TEXACO INC
3350 WILSHIRE BLVD
LOS ANGELES 5 CAL

MORSE FRANK MCCLAEB
CALIFORNIA RES CORP
P O BOX 1627
RICHMOND CAL

CHARLES R MCCLELLAN
STD OIL CO OF CALIF
540 VICHY HILL ROAD
UKIAH CAL

R J MCCLOSKEY
GEO P DEMPLER CO
1610 POTOMAC AV
PITTSBURGH 16 PA

ERNEST E MCCLUNG
VAN STRAATEN CHEM CO
630 W WASHINGTON ST
CHICAGO 6 ILL

ROBERT S MCCORD
DOUGLAS AIRCRAFT CO DEPT A852
3000 OCEAN PARK BLVD
SANTA MONICA CAL

HAROLD W MCCOY
DELCO REMY DIVISION GMC
ANDERSON INDIANA

JOHN R MCCOY
IND COMMERCIAL FILTERS CORP
415 INDIANAPOLIS
LEBANON INDIANA

HARRY W MCCULLOCH JR
SHELL OIL CO PROD APPL DEPT
624 SOUTH MICHIGAN AV
CHICAGO 5 ILL

G L MCCUMBER
SOUTHWEST GREASE & OIL
1459 WOODLAND
WICHITA KANSAS

CLAIR H MCDEAVITT
CENTRAL PETROLEUM CO
EAST LAKE ROAD
RIPLEY NEW YORK

EWELL E MCDOLE
KAISER ALUMINUM & CHEM CORP
KAISER CENTER
OAKLAND CAL

HAROLD MCDONALD
CONTINENTAL OIL CO
1 W FOREST AV
ENGLEWOOD NEW JERSEY

LEO R MCDONALD
J P MURRAY CO PITT PA
115 WILMA AV
STEUBENVILLE OHIO

STUART L MCDONIEL
SANITARY DIST OF CHGO
5804 S MARSHFIELD AV
CHICAGO 36 ILL

C I R MCDOUGALL
SHELL OIL CO LTD
31 CARTIER CRESCENT
SCARBOROUGH ONT CANADA

ROBERT E MCEACHRON
THE MIEHLE CO
2011 HASTINGS
CHICAGO 8 ILL

J B MCFAIL
ONAN DIV STUDEBAKER PACKARD CP
2515 UNIVERSITY AV
MINNEAPOLIS 14 MINNESOTA

WM E MCGAFFNEY
THE IRONSIDES CO
3209 MEREDYTH LANE
YOUNGSTOWN 11 OHIO

REGIS E MCGANN
F D JOHNSON CO
28815 AURORA ROAD
SOLON OHIO

ZEL G MCGEE
MCGEE CHEMICAL CO INC
8000 W CHESTER PIKE
UPPER DARBY PA

LEWIS W MCKEE
THE BARDEN CORP
DANBURY CONN

SAM H MCGLUMPHY
QUAKER STATE OIL REFINERY CORP
1ST & CLAY ST
MARTINS FERRY OHIO

JOHN A MCGOWAN
ALCO PRODUCTS INC
SCHENECTADY 5 NEW YORK

IRVING T MCGRATH
FRANKLIN OIL & GREASE CO
P O BOX 8111 PLAZA STA
KANSAS CITY 12 MO

JOHN F MCGROGAN
ATLANTIC REFINING CO
MINNETONKA TRAIL
MEDFORD LAKES NEW JERSEY

JOSEPH A MCGROARTY
MERCK & COMPANY INC
RAHWAY NEW JERSEY

FRANK D MCGREEVY
CHAMPLIN OIL & REFINING CO
P O BOX 552
ENID OKLA

WILLIAM JOHN MCGUINTY
STONE FRANKLIN OF CAN LTD
7035 GRAND AV
MONTREAL 10 QUE CANADA

JAMES EDWARD MCGUIRK
CENTRAL PETROLEUM CO
4TH & MAIN
QUAPAW OKLA

H J MCHENRY
JOHNS MANVILLE CO
KOPPERS BUILDING
PITTSBURGH 19 PA

ROBERT MCKAY III
CITIES SERV OIL CO
27 LAKE DRIVE
FREEHOLD NEW JERSEY

JOHN R MCKEE
FISKE BROS REFINING CO
13817 NORTH DRIVE
CLEVELAND 5 OHIO

RALPH E MCKELVEY
TIMKEN ROLLER BEARING CO
614 SOUTH CHAPEL
LOUISVILLE OHIO

R W MCKEWON
CITIES SERVICE OIL CO
3101 EUCLID
CLEVELAND 15 OHIO

ROBERT F MCKIBBEN
NATIONAL CASH REGISTER CO
MAIN & K STREETS
DAYTON 9 OHIO

CORWIN D MCLEAN
CAL RESEARCH CORP
324 EL SEGUNDO BLVD
EL SEGUNDO CAL

JOHN O MCLEAN
REYNOLDS METALS CO
1519 SUMMIT AV
RICHMOND VIRGINIA

JAMES MCLELLAND
SOCONY MOBIL OIL CO
367 MIDDLE ST
BRAINTREE MASS

DONALD C MCMACKEN
SHELL OIL CO
100 BUSH ST
SAN FRANCISCO 6 CAL

RAYMOND G MCMAHAN
MOBIL OIL COMPANY
150 EAST 42ND ST
NEW YORK 17 NEW YORK

CHAS F MCMANUS
BUDD COMPANY
8839 BRADFORD
PHILADELPHIA 15 PA

WALLACE A MCMILLAN
TEXACO INCORPORATED
P O BOX 509
BEACON NEW YORK

GEORGE H MCMILLEN
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER 5 MASS

ARTHUR J MCNABB
PHOENIX STEEL CORP
210 VIRGINIA AV
PHOENIXVILLE PA

ROBERT B MCNATT
GARLOCK PACKING CO
RR 2 WHITEHALL ROAD
ANNAPOLIS MARYLAND

ALVIN S MCNEILLY
ESSO STD OIL CO
71 LINCOLN ST
MELROSE 76 MASS

FRED G MCNELLY
TIDEWATER OIL CO
4108 48TH AV SOUTH
SEATTLE 18 WASHINGTON

JOHN R MCPHEE
IRONSIDES CO
23 BOTSFORD ROAD
POLAND OHIO

ROBERT H MCPHEE
WHEELING STEEL CORP
WHEELING STEEL RES LAB
WHEELING W VA

BRUCE MCRAE
CONTINENTAL OIL CO
BOX 2250
SALT LAKE CITY 19 UTAH

FRED MCVEIGH
THE PURE OIL CO
39TH & NEVILLE STS
PITTSBURGH 24 PA

DAVID JEFFERSON MCWHORTER
THE PURE OIL CO
BOX 9145
PITTSBURGH 24 PA

FRANCIS S MEADE
ROCK ISLAND ARSENAL
2112 37TH ST
ROCK ISLAND ILLINOIS

CARROLL A MEADER
HIGHWAY EQUIPMENT CO
R R 5
SPOKANE WASHINGTON

RUSSELL W MEALS
SINCLAIR REFINING CO
600 FIFTH AV
NEW YORK 20 NEW YORK

JOHN E MEEHAN
TIDEWATER OIL CO
505 MAGEE BLDG 336 4TH AV
PITTSBURGH 22 PA

PAUL F MEEK
STD OIL CO
20077 LORAIN ROAD
FAIRVIEW PARK 26 OHIO

ROBERT EUGENE MEEKER
THE IRONSIDES CO
35 BLUE RIDGE DRIVE
YOUNGSTOWN OHIO

BERT L MELCHAR
SOUTHWEST GREASE & OIL CO
220 W WATERMAN
WICHITA KANSAS

HOWARD R MELLOR
MOBIL OIL CO INC
294 CLOVERSIDE DRIVE
WEST SENECA NEW YORK

ARTHUR T MENGEL
WALLOVER OIL CO
656 MEADOW LANE VALLEY VIEW
ROCHESTER PA

GEO E MENSCH
STD OIL CO OHIO
735 WHIPPLE S W
CANTON 10 OHIO

CHAS S MERCER
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER MASS

M E MERCHANT
CINCINNATI MILLING MACHINE CO
RESEARCH DEPT
CINCINNATI 9 OHIO

GEO E MERKLE
FISKE BROS REFINING CO
129 LOCKWOOD
NEWARK 5 NEW JERSEY

RANDOLPH STEWART MERRITT
ALEMITE CO OF MD
3503 MONTROSE AV
RICHMOND 22 VA

W W MERRYMAN
CONT OIL CO TECH SVS DIV
DRAWER 1267
PONCA CITY OKLA

LEONARD T MESEROLE
NAVAL AIR STA N ISLAND
4625 73RD ST
LA MESA CALIFORNIA

HUGH B MESERVE
PARKER HANNIFIN CORP
323 E WASHINGTON ST
VILLA PARK ILL

HAROLD V MESSICK
ASHLAND OIL & REFINING CO
ASHLAND KENTUCKY

JOSEPH MESSINA
FRANKFORD ARSENAL
BRIDGE & TACONY STS
PHILADELPHIA 37 PA

GORDON S METCALFE
HAMMOND & METCALFE
20 NORTH WACKER DR
CHICAGO 6 ILL

PAUL METZGER
WHEELING STEEL CORP
HILLVIEW HEIGHTS
ST CLAIRSVILLE, OHIO

HAROLD E MEUNIER
TEXACO INC
142 S ST JOHNS LANE
ELLICOTT CITY MARYLAND

WALTER L MEURER
EHRET & KINSEY
3904 WEST VLIET ST
MILWAUKEE 8 WIS

GUNTER H MEYER
DEOGRANDEL
72 T STREET
SALT LAKE CITY 3 UTAH

NORMAN A MEYER
CALIFORNIA OIL CO
ELK DRIVE R D 2
MALVERN PA

PETER C MEYER
SUN OIL COMPANY
436 DOREMUS AV
NEWARK 5 NEW JERSEY

ROBERT W MEYERS
MANZEL DIV HOUDAILLE IND INC
315 BABCOCK ST
BUFFALO NEW YORK

FRANCIS L MICHAELIS
SINCLAIR REFINING CO
BOX 7 PACKERS STATION
KANSAS CITY 19 KANSAS

MURRAY MICHLIN
ESSO STD DIV HUMBLE OIL
23 EAST ELIZABETH ST
SKANEATELES NEW YORK

JOSEPH J MIKITA
E I DU PONT DE NEMOURS
PETROLEUM CHEMICALS DIV
WILMINGTON 98 DELAWARE

EARL C MILHORN
WHEELING STEEL CORP
YORKVILLE WORKS
YORKVILLE OHIO

CHESTER MILKOWSKI
VAN STRAATEN CHEM CO
302 S HIGHLAND AV
AURORA ILL

BARSTOW H MILLER
IMPERIAL OIL LIMITED
200 SHERBROOKE ST W
MONTREAL QUE CAN

CLYDE ROBERT MILLER
THE G H BERLIN OIL CO
409 WINDSOR ST P O BOX 1121
HARTFORD 1 CONN

CORT L MILLER
EASTMAN KODAK CO
KODAK PARK B 23
ROCHESTER 13 NEW YORK

GEORGE W MILLER
BATTENFELD GREASE & OIL CO N Y
BOX 144
NORTH TONAWANDA NEW YORK

HARRY L MILLER
HARRY MILLER CORP
4TH & BRISTOL STS
PHILADELPHIA 40 PA

JOHN EDWARD MILLER
THE ALEMITE CO OF MD
5933 CHARNWOOD ROAD
BALTIMORE 28 MARYLAND

M D MILLER
ALEMITE CO OF WIS INC
1010 N VAN BUREN ST
MILWAUKEE 2 WIS

O L MILLER
ESSO STD DV HUM OIL & REF CO
P O BOX 713
CHARLESTON WEST VIRGINIA

PAUL W MILLER
CHESAPEAKE & OHIO RR
1702 18TH ST
HUNTINGTON WEST VIRGINIA

PHIL HOWARD MILLER
UNION CARBIDE CHEM CO
1245 WOODLAND DRIVE
CHARLESTON WEST VIRGINIA

ROBERT E MILLER
NATIONAL VIDEO CORP
4300 W 47TH ST
CHICAGO 32 ILL

THOMAS W MILLER
VAN STRAATEN CHEM CO
8634 ROCKEFELLER AV
BROOKFIELD ILL

VINCENT H MILLER
CONTINENTAL OIL CO
BOX 2250
SALT LAKE CITY 10 UTAH

WARREN H MILLER
BATTENFELD GREASE & OIL CO N Y
BOX 144
NORTH TONAWANDA NEW YORK

WILLIAM H MILLETT
UN CARB CHEM CO TECH SERV LAB
P O BOX 65
TARRYTOWN NEW YORK

RAYMOND MILLETTE
NORTHERN ELEC CO LTD DEPT 4815
P O BOX 6124
MONTREAL QUE CANADA

R SHELDON MILLIGAN JR
MILLIGAN SPIKA CO
1485 BAYSHORE BLVD
SAN FRANCISCO 24 CAL

ERNEST MILLS
SHELL OIL CO CANADA LTD
1040 GREENWOOD AV
TORONTO 6 ONT CANADA

RALPH S MINOR JR
COLUMBIA GENEVA STEEL
3313 LAS HUERTAS ROAD
LAFAYETTE CAL

EDWARD MIRONCHIK
SHELL OIL CO
850 EAST FRONT ST
WINONA MINNESOTA

EDWIN C MISSBACH
KOLKER CHEMICAL CORP
600 DOREMUS AV
NEWARK NEW JERSEY

DAVID H MICHAEL
HULBURT OIL & GREASE CO
TRENTON & CASTOR AVES
PHILADELPHIA 34 PA

BILL MITACEK
PHILLIPS PETROLEUM CO
1553 ELM
BARTLESVILLE OKLA

CHESTER A MITCHELL
THE LOYAL GROUP
3200 SOUTH WESTERN AV
CHICAGO 8 ILL

DAVID C MITCHELL
JOHNSON BRONZE
SOUTH MILL ST
NEW CASTLE PA

JAMES R MITCHELL
FARREL BIRMINGHAM CO INC
25 MAIN ST
ANSONIA CONN

PHILIP E MITCHELL
THE DELAVAL SEPARATOR
26367 RECHNER DRIVE
WESTLAKE OHIO

ROBERT W MITCHELL
SHELL OIL CO
2157 WEST 3RD
CLEVELAND 13 OHIO

WALTER L MITTEL
CANADA PACKERS LTD
2200 ST CLAIR AV WEST
TORONTO 9 ONT CANADA

LOUIS F MOCK JR
RICHFIELD OIL CORP
631 RYAN AV
LA HABRA CAL

LEE N MOCKRUD
RITTER ENGINEERING CO
5120 BLUE MOUND RD
MILWAUKEE 8 WIS

R L MOHLHENRICH
LOUIS H HEIN COMPANY
703 LIGHT ST
BALTIMORE 30 MARYLAND

JAMES A MOKAS
SUN OIL CO
1628 SIMPSON DR
COLUMBUS 13 OHIO

THOMAS JOSEPH MOLESKY
E F HOUGHTON & CO
320 WAVELAND ROAD
BALTIMORE 28 MARYLAND

WILLIAM A MOLIM
GULF OIL CORP
7148 CHARLES ST
PHILADELPHIA 35 PA

RAYMOND B MOLITOR
PRODUCERS CONTAINER CO
SAVAGE MINNESOTA

BOB MOLNARI
EGGELHOF ENGINEERS INC
1912 HUSSION BOX 1743
HOUSTON 1 TEXAS

FRANK MONAGHAN
CENTRAL PETROLEUM COMPANY
103 SECOND AV APT 9
NEWARK 4 NEW JERSEY

FRANK J MONTALBANO
LOUIS H HEIN COMPANY
1151 MATSONS FORD ROAD
WEST CONSHOHOCKEN PA

CHARLES P MONTI
TEXACO INC
421 WILLOW AV
DEERFIELD ILL

LUDWIG L MOTULSKY
THOMPSON RAMO WOOLDRIDGE INC
23555 EUCLID AV
CLEVELAND 17 OHIO

HOWARD S MOODY
IMPERIAL OIL LTD
63 HAILEBURY DRIVE
TORONTO ONT CANADA

JAMES A MOODY
J A MOODY COMPANY
15 NORTH DEVON BLVD
DEVON PA

LOUIS H MOODY
P O BOX 734
VENICE FLORIDA

OSCAR C MOON
BENDIX CORP K C DIV
P O BOX 1159
KANSAS CITY 41 MISSOURI

CHARLES T MOORMAN
TEXAS RESEARCH ASSOCIATES
170 GUADALUPE
AUSTIN 1 TEXAS

ALLAN L MOORE
SHELL OIL CO OF CANADA LTD
P O BOX 400 TERMINAL A
TORONTO 1 ONT CANADA

CLINTON C MOORE
GENERAL ELECTRIC CO
BUILDING 500
EVENDALE OHIO

CORNELIUS F MOORE
E H KELLOGG & CO INC
63 EAST FIRST ST
MT VERNON NEW YORK

JACK F MOORE
CITIES SERV OIL CO
902 EAST 131ST ST
CARMEL INDIANA

RICHARD E MOORE
HUGHES TOOL CO AIRCRAFT DIV
CULVER CITY CAL

RONALD L MOORE
CENTRAL PETROLEUM CO
548 STANDARD BLDG
CLEVELAND 13 OHIO

WM W MOORE
SOCONY MOBIL OIL CO
P O BOX 477
TRENTON MICH

ANGUS MOREHEAD
TENNESSEE EASTMAN CO
KINGSPORT TENN

PAUL F MORENZ
CITIES SERVICE OIL CO
22 ORCHARD DRIVE
FLORISSANT 21 MISSOURI

D H MORETON
MORCO ENGINNERING CO
560 MARQUETTE
PACIFIC PALISADES CAL

HARRY W MOREY JR
CELANESE CHEMICAL CO
180 MADISON AV
NEW YORK NEW YORK

C B MORGAN JR
LOUIS H HEIN COMPANY
576 LOCKHAVEN DRIVE
RIVER VALE NEW JERSEY

CHAS MORGAN
COPPERWELD STEEL CO
MAHONING AV EXTENSION
WARREN OHIO

WILLIAM C MORGAN
PENN PETROLEUM CORP
14923 PINEHURST
DETROIT 38 MICH

JAMES N MORIARITY
EASTMAN KODAK CO
102 COTTAGE ST
ROCHESTER 8 NEW YORK

N C MORRELL
CAMERA WORKS EASTMAN KODAK CO
333 STATE ST
ROCHESTER 4 NEW YORK

GEORGE J MORRIS
THE MARTIN CO BALTIMORE
2615 HARWOOD ROAD
BALTIMORE 14 MARYLAND

JOHN G MORRIS
STANDARD PRESSED STEEL
KENMORE & HIGHLAND AV
JENKINTOWN PA

PHILIP F MORRIS
CIA DISTRIBUIDORA DE AUTOS S A
AV 28 DE JULIO 2350
LIMA PERU SO AMERICA

W R MORRIS
CRANE PACKING CO LTD
617 PARKDALE AV N
HAMILTON ONT CANADA

W MORRISON
BROOKS OIL CO
1457 WEST LIBERTY ST
HUBBARD OHIO

WILLIAM M MORRISON JR
ATLANTIC REFINING CO
32 BESTY LANE
AMBLER PA

ANDREW S MORROW
SHELL OIL COMPANY
50 WEST 50TH ST
NEW YORK 20 NEW YORK

JOHN E MORROW
FISKE BROS REFINING CO
1303 N WAHNETA ST
ALLENTOWN PA

H M MORTON
GARLOCK PACKING CO
TIPPECANOE ROAD RD 2
CANFIELD OHIO

MARTEN K MOSHER
CITIES SERV OIL CO
2105 THOMPSON ST
LAFAYETTE INDIANA

K C MOSIER
K C MOSIER CO
628 SOUTH LUDLOW ST
DAYTON OHIO

JAMES C MOSTELLER
ROYAL LUBRICANTS CO
RIVER ROAD
HANOVER NEW JERSEY

ROBERT H MOTH
THE PURE OIL CO
200 EAST GOLF ROAD
PALATINE ILL

RAYMOND L MOY
MONSANTO CHEM CO
400 FOREST DRIVE
UNION NEW JERSEY

FRANK H MROZEK
ACHESON COLLOIDS CO
111 EAST FIRST AV
ROSELLE NEW JERSEY

CARL H MUELLER
LINCOLN ENGRG CO
7228 S ROLAND BLVD
ST LOUIS 21 MISSOURI

EDWARD R MUELLER
UNION CARBIDE CHEM CO
P O BOX 65
TARRYTOWN NEW YORK

HARRY C MUFFLEY
ROCK ISLAND ARSENAL
4060 25TH AV
ROCK ISLAND ILLINOIS

A G Y MUKTAY
CR ADAMJEE PAPER BOARD
MILLS NOWSHERA WEST PAKISTAN

JOHN P MULLENIX
S C JOHNSON & SONS INC
1525 HOWE ST
RACINE WIS

HENRY MULLER
SHELL OIL CO INC
50 WEST 50TH ST
NEW YORK 20 NEW YORK

WILLIAM G NATZKE
CINCINNATI MILLING PROD
5600 SOUTH 104TH ST
HALES CORNERS WIS

A LORN MUNRO
SMITH ENGINEERS WORKS
532 E CAPITOL DR
MILWAUKEE 12 WIS

CHAS M MURPHY JR
CODE 6170
NAVAL RESEARCH LAB
WASHINGTON 25 D C

GEORGE J MURPHY
PENN CONVOY PETROLEUM PROD
1410 NORTH FRONT ST
PHILADELPHIA PA

FRANCIS E MURPHY
WALWORTH CO
1505 WASHINGTON ST
BRAINTREE 85 MASS

MURLAN J MURPHY
MURPHY PHOENIX CO
9505 CASSIUS AV
CLEVELAND 5 OHIO

J P MURRAY
J P MURRAY CO
311 ROSS ST
PITTSBURGH PA

JOHN L MURRAY
ESSO STD DIV HUM OIL & REF CO
9 BELL DRIVE
WESTFIELD NEW JERSEY

THOMAS M MURPHY
ALEMITE DIV STEWART WARNER COR
1826 DIVERSEY PARKWAY
CHICAGO 14 ILL

WM P MURPHY
THE LUBRIZOL CORP
505 N WASH ST BANK NAPER BLDG
NAPERVILLE ILL

S FRANK MURRAY
GENERAL ELEC CO GEN ENGRG LAB
1 RIVER ROAD
SCHENECTADY 5 NEW YORK

BOB J MURRELL
LINCOLN ENGRG CO
8627 WOODWARD AV
DETROIT 2 MICH

VICTOR JOHN MUTTON
BURLINGTON STEEL CO
R R 1
ANCASTER ONT CANADA

E FRANK MUTZ
CITIES SERV OIL CO
552 ROBINSON TER
UNION NEW JERSEY

JAMES G MYER
UNION OIL CO OF CAL
P O BOX 7600
LOS ANGELES 54 CAL

RAWDON MYERS
RAWDON MYERS AGENCY
BLUE ASH CENTER BLDG
CINCINNATI 42 OHIO

WM B MYERS
MANZEL DIV HOUDAILLE IND
530 HIGHLAND AV P O BOX 51
COLLINGSWOOD NEW JERSEY

ALAN B MYLER
SUN OIL CO
1608 WALNUT ST
PHILADELPHIA 3 PA

BURT E MYRICK JR
DELCO BATTERY CORP
30 PIERSON AV
PRINCETON NEW JERSEY

WILLIAM L NAPOLI
TIDEWATER OIL CO
660 MADISON AV
NEW YORK 21 NEW YORK

G V NATARAJAN
BHILAI STEEL PLANT
NO 128 STREET NO 24 SECTOR 10
MADLAY RODESH INDIA

ROBERT A NAWMAN
SHELL OIL CO
3388 REDDING ROAD
COLUMBUS OHIO

HARRY NAYLOR
SHELL RESEARCH LTD
P O BOX 1
CHESTER ENGLAND

SYDNEY J NEEDS
KINGSBURY MACH WORKS
4324 TACKAWANNA ST
FRANKFORD PHILADELPHIA PA

ROY K NEILL
CHRYSLER CORP
12800 OAKLAND
HIGHLAND PARK 3 MICH

BIRGER H NEILSON
WALDORF PAPER PROD CO
2429 35TH AV S
MINNEAPOLIS MINNESOTA

CARL A NELSON
MONSANTO CHEMICAL CO
MONSANTO AV
SPRINGFIELD MASS

C EMERY NELSON
C EMERY NELSON INC
2404 E HENNEPIN
MINNEAPOLIS MINNESOTA

DON L NELSON
STD OIL CO
8014 JOHNSON DRIVE
MERRIAM KANSAS

LLOYD P NELSON
MAGNOLIA PETROLEUM CO
P O BOX 1740
HOUSTON TEXAS

RAY NELSON
C H SPENCER & CO
BOX 1954
SALT LAKE CITY 10 UTAH

ZOLTON N MEMETH
NACA LFPL
5829 AKINS ROAD
NORTH ROYALTON 33 OHIO

FRANK T NEMITS
MONSANTO CHEMICAL CO
6670 EAST FLOTILLA ST
LOS ANGELES 22 CAL

MATTHEW C NENADIC
NAT BISC CO SHREDDED WHEAT BAK
ERIE AV & 10TH ST
NIAGARA FALLS NEW YORK

TERENCE R G NEWCOMEN
LUBRICANTS & TSB DEPT BP LTD
550 SHERBROOKE ST
MONTREAL 2 QUE CANADA

C DEAN NEWNAN
CALIF CHEM CO ORONITE DIV
1 ROCKEFELLER PLAZA
NEW YORK 20 NEW YORK

EDMUND J NEWTON
VAN STRAATEN CHEMICAL CO
1126 MADISON
EVANSTON ILL

WILLIAM E NEWTON
CLEVE DIESEL ENG DIV GMC
61 YALE ST
BLOOMFIELD NEW JERSEY

JAMES F NICHOLAS
ARGUTO OILLESS BEARING CO
149 BERKLEY ST
PHILADELPHIA 44 PA

C W NICHOLS JR
SOCONY MOBIL OIL CO INC
412 GREENPOINT AV
BROOKLYN 22 NEW YORK

CLYDE D NICHOLSON
ESSO STANDARD OIL CO
601 PATTERSON ROAD
BETHEL PARK PA

WM STUART NICHOLSON
TEXACO INCORPORATED
1111 RUSH AV
HOUSTON 2 TEXAS

ALAN NICOL
THE CHARDON RUBBER CO
CHARDON OHIO

R H NITTINGER
GEN CHEM DIV ALLIED CHEM
595 NORTHFIELD AV APT 90
WEST ORANGE NEW JERSEY

W H NIEDERMEIER
SHELL OIL CO
1212 SOUTH CENTRAL
CLAYTON 5 MISSOURI

J P NIEHAUS
SHELL OIL CO
7901 LINDIS FORNE DR
PITTSBURGH 37 PA

HOWARD E NIEHAUS
KAISER ALUMINUM & CHEM CORP
RAVENSWOOD WORKS
RAVENSWOOD WEST VIRGINIA

CLEVEL R NIXON
SOCONY MOBIL OIL CO
113 CHESTNUT ST
GARDEN CITY L I NEW YORK

THOMAS T NOLAND
R T VANDERBILT CO INC
FORBELL DRIVE
NORWALK CONN

DAVID M NOLTIE
THE ALPHA MOLYKOTE CORP
65 HARVARD AV
STAMFORD CONN

MASASHI NOMURA
THE PENNZOIL CO TOKYO
CPO BOX 905
TOKYO JAPAN

K H NONWEILER
SHELL OIL CO
P O BOX 1703
ATLANTA 1 GA

BURT S NOREEN
OSCARE CHYTRAUS CO
2878 SOUTH 2540 EAST
SALT LAKE CITY UTAH

C A NORGREN
C A NORGREN CO
3400 S ELATI ST
ENGLEWOOD COLORADO

LOUIS H NORRIS
ESSO STD OIL CO
125 WESTHILL AV
SOMERSET MASS

WALTER NORRIS
C A NORGREN CO
20 NORTH WACKER DR
CHICAGO 6 ILL

O A NORTON
NO AM AVIATION AUTONETICS DIV
4817 102 CLARK
LONG BEACH CAL

ROBERT L NOURIE
LEONARD R NOURIE INC
2414 W LIBERTY AV
PITTSBURGH 26 PA

CHARLES W NOVAK
VISCOSITY OIL CO
3200 SOUTH WESTERN AV
CHICAGO 8 ILL

ROBIN S NOWELL JR
BATTENFELD GREASE & OIL
19530 S ALAMEDA
COMPTON CAL

EUGENE NOZEWSKI
MASSEY FERGUSON LTD
9 BROW DRIVE
TORONTO 14 ONT CANADA

RISS E NYERGES
STAND OIL CO
4850 EAST 49TH ST
CLEVELAND 25 OHIO

RAYMOND J OAKLEY
AMERICAN LUBRICANTS CO
1575 CLINTON ST
BUFFALO 23 NEW YORK

EDWARD A OBERRIGHT
SOCONY MOBIL OIL CO
RESEARCH DEPARTMENT
PAULSBORO NEW JERSEY

CHARLES OBERST
HOUDAILLE IND INC
773 BUCHANAN ROAD
EAST MEADOW L I NEW YORK

JACK D ONNIE
LINCOLN LUB SYSTEMS
1789 SARATOGA AV
CLEVELAND 9 OHIO

JOSEPH W OBRIEN
METAL LUBRICANTS CO
407 DRAKE AV
ADDISON ILL

LESTER E OBRIEN
SOCONY MOBIL OIL CO
650 PRINCETON AV
GARDEN CITY L I NEW YORK

RAIMUND F OBRIEN JR
THE CALIFORNIA OIL CO
214 HARVARD AV
BOSTON 34 MASS

STUART C OBYRNE
GARLOCK INC
600 W JACKSON BLVD
CHICAGO 6 ILL

JAMES J OCONNOR
MCGRAW HILL PUB CO
330 WEST 42ND ST
NEW YORK 18 NEW YORK

ELLWOOD J ODONNELL
ALEMITE CO OF EASTERN PA
704 NORTH 16TH ST
PHILADELPHIA 30 PA

L DOUGLAS OFFER
SHELL OIL CO OF CANADA LTD
505 UNIVERSITY AV
TORONTO ONT CANADA

TOSHIIKI OIKAWA
MARUZEN OIL CO OF JAPAN
375 PARK AV
NEW YORK 22 NEW YORK

W T J OLIPHANT
PATENT CHEM INC
5 PARK ST
BLOOMFIELD NEW JERSEY

GEORGE W OLIVER
CONVAIR
4681 MT HORTON DR
SAN DIEGO 17 CAL

MORRIS A OLIVER
AMP INC RESEARCH DIVISION
HARRISBURG PA

JOHN S OLSEN
ESSO STD DIV HUMBLE OIL
2700 AUTUMN WOOD AV
GLENSHAW PA

GODTFRED A OLSEN
SUNLAND REFINING CO
P O BOX 1512
FRESNO CAL

OSCAR L OLSEN
HUMBLE OIL & REFINING CO
1020 HOLCOMBE BLVD
HOUSTON 25 TEXAS

SIGURD OLSEN
I T E CIRCUIT BREAKER CO
445 NORTH 19TH ST
PHILADELPHIA 30 PA

THOMAS G OLSEN
THE PURE OIL CO
39TH & NEVILLE P O BOX 9145
PITTSBURGH 24 PA

PAUL P OLSON
MOBIL OIL CO
5030 BEACH DRIVE
SEATTLE 16 WASHINGTON

RALPH G OLSON
SINCLAIR REFINING CO
8618 CHICAGO
MINNEAPOLIS 20 MINNESOTA

ROBERT E OLSON
DANLY MACH SPECIALTIES INC
2100 SOUTH LARAMIE
CHICAGO 50 ILL

ARTHUR T OLSSON
ACHESON COLL CO DV ACH IND INC
1207 PALMER COURT
PORT HURON MICH

A C OPPENHEIM
FIRESTONE TIRE & RUBBER
SUNSET ROAD P O BOX 118
LIMERICK PA

HOWARD J OPPER
D X SUNRAY OIL CO
500 HOME PARK BLVD
WATERLOO IOWA

FERDERIC K ORCUTT
BATTELLE MEMORIAL INST
505 KING AV
COLUMBUS 1 OHIO

M J OREILLY
CR LIBR SERV LEVER BROS LTD
299 EASTERN AV
TORONTO ONT CANADA

JOHN W ORELUP
PATENT CHEMICAL INC
335 MCLEAN BLVD
PATERSON 4 NEW JERSEY

JOHN F OSTERLE
CARNEGIE INST OF TECH
SCHENLEY PARK
PITTSBURGH 13 PA

THOMAS OSTERS
CLEV GRAP BRON CO DIV CLEV COR
17000 ST CLAIR AV
CLEVELAND 10 OHIO

ROBERT F OSTMANN
WAGNER ELECTRIC CORP
6400 PLYMOUTH AV
ST LOUIS 33 MISSOURI

LEON M OSWALT
CATO OIL & GREASE CO
P O BOX 1984
OKLAHOMA CITY OKLA

ROBERT A OTCASEK
LUBRIZOL
P O BOX 3057
CLEVELAND 17 OHIO

FRANK H OTT
UNION OIL CO OF CAL
1317 SOUTH THIRD AV
ARCADIA CAL

RICHARD F OVERHOFF
ESSO RES & ENGRG CO
P O BOX 51
LINDEN NEW JERSEY

HAROLD L OWEN
RIEGEL TEXTILE CORP
WARE SHOALS SOUTH CAROLINA

GEORGE OWENS
GEO OWENS & CO
P O BOX 182
SYRACUSE NEW YORK

A BRUCE PAAKH
REILLY WHITEMAN WALTON
7008 KINGSBURY
DEARBORN MICH

WAYNE R PACKER
VAN STRAATEN CHEM CO
1407 WEST 50TH ST
KANSAS CITY MISSOURI

SIDNEY L PADDOCK
CITIES SERVICE OIL CO
184 DOGWOOD LANE
MERIDEN CONN

O L PAGETT
AIRTEMP
772 FAWCETT DRIVE
XENIA OHIO

FREDERICK V PAINE JR
OIL PRO & CHE CO DV NAT ALU CP
LAUREL LANE
ALLISON PARK PA

CHARLES PALMER
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER 5 MASS

E B PALMER
CONVAIR FORT WORTH
3321 LIVINGSTON
FORT WORTH 10 TEXAS

EDWARD R PALMER
MONSANTO CHEM LTD MONSANTO HSE
10 18 VICTORIA ST
LONDON S W 1 ENGLAND

ALVIN M PANKRATZ
U S ARMY
4711 THOBE ROAD
TOLEDO 15 OHIO

W C PANNIER
SHELL OIL CO
719 S ASHLAND AV
LA GRANGE ILL

MICHAEL W PAPP
WARNER & SWASEY CO
5701 CARNEGIE AV
CLEVELAND 3 OHIO

SIDNEY A PARADEE
OIL PROD CO DIV NALCO CHEM CO
9165 HARBOR AV
CHICAGO 17 ILL

JOSEPH P PARDO
STA VIS OIL CO
2314 WYCLIFF ST
ST PAUL 14 MINNESOTA

BURNARD H PARKER
RICHFIELD OIL CO
175 ALTA LOMA DRIVE
SO SAN FRANCISCO CAL

JOHN FRANCIS PARKER
TECALEMIT CANADA LTD
REXDALE BLVD
REXDALE ONT CANADA

MORTON PARKER
E F HOUGHTON & CO
401 BESSEMER BLDG
PITTSBURGH 22 PA

WAYNE A PARKHILL
CITIES SERV OIL CO
1013 W WHITE P O BOX 90
MARION ILLINOIS

ARNOLD J PARUS
STANDARD OIL CO INC
4925 WICK DRIVE
OAK LAWN ILL

EDSEL G PARSONS
INTERNATIONAL HARVESTER
MR 4 FAIRFIELD PIKE
SPRINGFIELD OHIO

JAMES L PARSONS
E I DU PONT DE NEMOURS & CO
LOUIVERS BLDG ENGRG SERV DIV
WILMINGTON DEL

WILLIAM G PARSONS
PENOLA OIL CO
51 DEARBORN AV
RYE NEW YORK

RALPH V PARTLOW
ESSO STD DIV HUM OIL & REF CO
EASTERN AV AT DUNDALK
BALTIMORE 24 MD

ANDREA PASTORINO
VIA VINCENZO NAZZARO 4
TORINO ITALY

DAVID CHAUVIN PATERSON
SHELL OIL CO OF CANADA LTD
1255 UNIVERSITY ST
MONTREAL QUE CANADA

DONALD ALEXANDER PATERSON
MONSANTO CANADA LIMITED
183 FRONT ST E
TORONTO 2 ONT CANADA

DONALD L PATTERSON
MANZEL DIV HOUDAILLE IND INC
315 BABCOCK ST
BUFFALO 10 NEW YORK

H H PATTERSON
CHAMP PAPER & FIB CO LUBR DEPT
P O BOX 872
PASADENA TEXAS

JOHN S PATTERSON
ATLANTIC REFINING CO
318 N EAGLE ROAD
HAVERTOWN PA

PETER C PATERSON
TIMKEN ROLLER BEARING CO
CANTON 6 OHIO

HARRY W PATTON
GLEASON WORKS
1000 UNIVERSITY AV
ROCHESTER NEW YORK

STEWART U PATTON
U S NAVAL ENGRG STA
P O BOX 215
SEVERNA PARK MD

ALFRED A PAUL
SHAKER CLUB APTS APT 302
19201 VAN AKEN BLVD
SHAKER HEIGHTS 22 OHIO

HAROLD D PAUL
W J BERNHART CO
2451 WEHRLE DRIVE
BUFFALO 21 NEW YORK

JOHN J PAVILUK
THE CALIF OIL CO
4013 PURDUE DRIVE
METAIRIE LOUISIANA

E R PAWLISCH
REFINERY PRODUCTS CO
4256 WESLEY TR
SCHILLER PARK ILL

R R PAXTON
PURE CARBON COMPANY INC
ST MARYS PA

EDWIN S PEARCE
RAILWAY SERV & SUPPLY CO
510 S HARDING ST
INDIANAPOLIS 7 INDIANA

ROBERT J PEARSON
PEARCE PEARSON CO
22 TOBEY ROAD
BLOOMFIELD CONN

HOWARD T PEEPLES
TIMKEN ROLLER BEARING CO
1835 DUEBER AV S W
CANTON 6 OHIO

CHARLES W PEHLE JR
U S STEEL CORP
15211 MEADOW LANE
DOLTON ILL

NORMAN C PENFOLD
AUTOMATIVE RES ASSOCIATES
2901 BANDERA ROAD
SAN ANTONIO TEXAS

PAUL M PERFECT
INTERNATIONAL PAPER CO
P O BOX 2487
PANAMA CITY FLORIDA

H P PERKINS
TEXACO INC
1707 KENT ROAD
CAMP HILL PA

I PAUL PERKINS
PENOLA OIL CO
216 SO WRIGHT ST
NAPERVILLE ILL

ERWIN E PERSO
TEXACO INC
1149 N JACKSON
GLENDALE 7 CAL

BERNARD PESETSKY
UNION CARBIDE CHEMICALS
2530 SPRING ST
CHARLESTON WEST VIRGINIA

J P PETREE
SHELL OIL CO
729 SHELL BUILDING
HOUSTON TEXAS

GEORGE O PETERS
MOBIL OIL SUDAN
P O BOX 283
KHARTOUM SUDAN AFRICA

JOHN E PETERS
THE DINGLE CLARK CO
832 ENGINEERS BUILDING
CLEVELAND 14 OHIO

ROBERT L PETERS
OIL KRAFT INC
3330 BEEKMAN ST
CINCINNATI 23 OHIO

DONALD E PETERSEN
UN CARB CHEM CO TECH SERV LAB
BOX 65
TARRYTOWN NEW YORK

DIAMOND PETERSON
LUBRICATION ENGINEERS INC
2809 RACE STREET
FORT WORTH 17 TEXAS

HOWARD A PETERSON
TEXACO INC
14823 EAST ANACONDA ST
WHITTIER CAL

J WILLARD PETERSON
AMERICAN OIL CO
910 S MICHIGAN AV RM 1330
CHICAGO 80 ILL

M B PETERSON
GENERAL ELECTRIC CO
BEARING & LUBRICANT CTR
SCHENECTADY NEW YORK

ROBERT W PETERSEN
NORTHLAND PRODUCTS CO
22 RAINBOW DRIVE
WATERLOO IOWA

TED PETERSON
S F BOWSER CO LTD
9 SHERIDAN LANE
HAMILTON ONT CANADA

WILLIAM M PETERSON
OLSEN MANUFACTURING CO INC
4622 DELEMERE
ROYAL OAK MICH

CHESLEY E PETITE
CANADIAN OIL COMPANIES LTD
385 BRIDGE ST
MONTREAL QUE CANADA

MARCO PETRONIO
FRANKFORD ARSENAL
PITMAN DUNN LABORATORY
PHILADELPHIA 37 PA

LEONARD E PETZINGER
PETZINGER ENGINEERING CO
1780 LAKE AV
CLEVELAND 7 OHIO

EDWIN J PFAFF
PFAFF & CO
96 EAST 219TH ST
CLEVELAND 23 OHIO

WM H PFEIFFER
TERNSTED DIV GMC
GEORGESVILLE ROAD
COLUMBUS 4 OHIO

BENJAMIN PHELPS
THE PURE OIL CO
1784 TAUNTON ROAD
BIRMINGHAM MICH

JAMES H PHILLIPS
TEXACO RESEARCH CENTER
BEACON NEW YORK

JOHN G PHILLIPS JR
CITIES SERV OIL CO
10500 MONTROSE AV
BETHESDA 14 MARYLAND

RICHARD M PIATT
UNION OIL CO OF CALIF
P O BOX 1912
PHOENIX ARIZONA

THOMAS S PICK
LAKE ONT PORTLAND CEMENT CO LD
22 LOW ST
PICTON ONTARIO CANADA

ANTHONY V PICKETT
DRAVO CORP
BOX 124
WARRENDALE PA

ROBERT S PIKE
TEXAS REFINERY CORP
OAK ST
EAST AUBURN MAINE

ANN GROTT PIKEN
BENDIX CORP RES LAB DIV
NORTHWESTERN HIGHWAY & 1 MILE
SOUTHFIELD MICHIGAN

DONALD G PIKOULAS
TEXAS INCORPORATED
2211 E WASHINGTON
LOS ANGELES 21 CAL

GEO A PILLSBURY
PILLSBURY CHEMICALS
1104 NOTTINGHAM ROAD
DETROIT 30 MICH

L G PINKERTON
BROOKS OIL CO
227 HORSHAM AV
WILLOWDALE ONT CANADA

JOSEPH F PISCITELL
R H MILLER CO INC
P O BOX 56
HOMER NEW YORK

BERNARD C PITTMAN
THE BAY PETROLEUM CORP
P O BOX 18
HOUSTON TEXAS

STANLEY PLATOZ
FAFNIR BEARING CO
26 ERWIN PLACE
NEW BRITAIN CONN

ARCHIE B PLATT
IMPERIAL OIL LTD
1271 WOODBINE AV
SUDBURY ONT CANADA

HOWARD D PLUMLY
NATL REFINING COMPANY
1325 EAST 35TH ST
BALTIMORE 18 MARYLAND

JOHN W POLICK
SHELL OIL CO
154 BAGLEY AV
DETROIT MICH

PAUL L POLIZZOTTO
E F HOUGHTON & CO
28709 GOYA DR
SAN PEDRO CAL

JOHN P POLING
GULF OIL CORP
1512 HAMPTON ROAD
CHARLESTON 4 WEST VIRGINIA

IRVING POLLOCK
TEXACO INCORPORATED
P O BOX 2332
HOUSTON 1 TEXAS

LLOYD H POMROY
ATLANTIC UNION OIL CO PTY LTD
66 PITT ST
SYDNEY N S W AUSTRALIA

ROBERT L PONTIOUS
SINCLAIR RES LABS
18443 GRANT ST
LANSING ILL

CHARLES L POPE
EASTMAN KODAK CO
BLDG 23 KODAK PARK
ROCHESTER 4 NEW YORK

WULLIAM E POPE
CONSUMERS COOPERATIVE ASSOC
P O BOX 7305
KANSAS CITY 16 MO

FRANCES POPEJOY
ALLEN LUBR CO N C CO AIRPORT
1404 REYBOLD AV
NEW CASTLE DELAWARE

D H POPMA
JOSEPH E SEAGRAM & SONS INC
LAWRENCEBURG IND

S F POPSON
GULF OIL CORP
521 ELINE AV
LOUISVILLE 7 KY

S F POPSON
GULF OIL CORP
P O BOX 946
TOLEDO 1 OHIO

STUART STANLEY PORTER
MARSTON SONS & CO
78 GROBY RD GLENFIELD
LEICESTERSHIRE ENGLAND

DONALD Q POST
TIDEWATER OIL CO
33 MITCHELL AV
WEST CALDWELL NEW JERSEY

EVERETT C POST
TIDEWATER OIL CO
1509 ARROTT BUILDING
PITTSBURGH 22 PA

EDWARD B POSTMA
WHITIN MACHINE WKS
446 CHURSH ST
WHITINSVILLE MASS

RAYMOND I POTTER
FORD MOTOR CO
21500 OAKWOOD BLV P O BX 2053
DEARBORN MICH

RICHARD G POTTER
D A STUART OIL CO LTD
2727 SOUTH TROY ST
CHICAGO 23 ILL

POL POULEAU
ESSO STANDARD BELGIUM S A
101 AVENUE DE FRANCE
ANTWERP BELGIUM

DONALD L POWELL
AUTO RESEARCH LABS INC
6947 WEST 59TH ST
CHICAGO 38 ILL

GLEN S POWELL
CONTINENTAL OIL CO
414 NORTH 12 WEST
SALT LAKE CITY 16 UTAH

JAMES BURR POWELL
J M SIMPSON OIL CO
P O BOX 2367
AMARILLO TEXAS

E R POWERS
DX SUNRAY OIL CO
5617 BJELDE LANE
MADISON 5 WIS

KENNETH P POWERS
GULF RESEARCH & DEV CO
P O DRAWER 2038
PITTSBURGH 30 PA

W J POWERS
ENJAY CHEMICAL COMPANY
19 WEST 51ST ST
NEW YORK 19 NEW YORK

KEITH PRALLE
RAMSAY & TREGANOWAN LTD
475 LATROBE ST
MELBOURNE VICTORIA AUSTRALIA

JOSEPH VAUGHAN PRATT
THE PURE OIL CO
P O BOX 5141
NORFOLK 10 VIRGINIA

ALEXANDER PREISLER
INDUSTRIAL TECTONICS INC
18301 SANTA FE AV
COMPTON CAL

WILLIAM A PRENDERGAST
TEXACO INCORPORATED
P O BOX 509
BEACON NEW YORK

F C PRESTON
CALTEX OIL AUSTRALIA
40 CARLTON ST HARBORD
SYDNEY N S W AUSTRALIA

PHILIP E PRIOR
INTERNATIONAL CHEM CO
48 COTTAGE GROVE CIRCLE
BLOOMFIELD CONN

CHARLES E PRITCHARD
ALAN WOOD STEEL CO
CONSHOHOCKEN PA

ALLAN PRIZEMAN
ESSO RESEARCH LTD
ESSO HOUSE
ABINGDON BERKSHIRE ENGLAND

OTIS G PRUSSELL MGR IND DIV
THE PENNZOIL CO
1630 W OLYMPIC BLVD
LOS ANGELES 15 CAL

EDWIN E PULS
CITIES SERVICE OIL CO
185 LINDEN ROAD
BIRMINGHAM MICH

FREDERICK C PURVIS
BRITISH AMERICAN OIL CO
560 COSGRAIN AV
ST LAMBERT QUE CANADA

ONEY P PURYEAR
TEXACO INCORPORATED
P O BOX 509
BEACON NEW YORK

FRANK PUSEY
E I DU PONT DE NEMOURS & CO
1025 SOUTH WABASH
CHICAGO 5 ILL

J W PUTT
WALTER KIDDE & CO INC
675 MAIN ST
BELLEVILLE 9 NEW JERSEY

JAMES VICTOR QUACKENBUSH
W OIL REFINING CO PTY LTD
24 CLAYTON ST
BELLEVUE W AUSTRALIA

FRANK C QUERRY JR
MCCORD CORPORATION
RIOPELIE & E GRAND BLVD
DETROIT 11 MICH

JOSEPH E QUINTY
EMERY INDUSTRIES INC
4300 CAREW TOWER
CINCINNATI 2 OHIO

ERNEST RABINOWICZ
MASS INST OF TECH ROOM 35 106
CAMBRIDGE 39 MASS

JOSEPH B RABA
W H BARBER CO
3650 S HOMAN AV
CHICAGO ILL

LOUIS RADEN
QUAKER CHEM PROD CORP
15330 IDAHO AV
DETROIT 38 MICH

GEORGE RADOSEVICH
AMERICAN MOTORS CORP
3880 N RICHARDS ST
MILWAUKEE WIS

FRANK RADOVICH
AMERICAN POTASH & CHEM CORP
3000 W 6TH ST
LOS ANGELES 54 CAL

FRANK H RAE
NORMA HOFFMAN BEARINGS CO
HAMILTON AVENUE
STAMFORD CONN

E C RAGATZ
ALLEN BRADLEY CO
136 WEST GREENFIELD AV
MILWAUKEE 4 WIS

ALBERT A RAIMONDI
WESTINGHOUSE RES LABS
BEULAH RD CHURCHILL BORO
PITTSBURGH 35 PA

DOMENIC L RAINONE
THOMPSON PRODUCTS CO
1359 BEACONFIELD
LYNDHURST OHIO

WILLIAM T RAMBO
STANDARD PRESSED STEEL CO
HIGHLAND AV
JENKINTOWN PA

J H RANEY
TEXACO INC
WARWICK ROAD
ORANGE MASS

THEODOR RANOV
SCH OF ENGRG UNIV OF BUFFALO
3435 MAIN ST
BUFFALO 14 NEW YORK

HARRY A RAU JR
SHELL OIL COMPANY
P O BOX 6870
BALTIMORE 4 MARYLAND

RALPH G RAUGHT
2636 BRANDYWINE DRIVE
ANN ARBOR MICHIGAN

JACK E RAWLINGS
STD OIL CO OF CALIF
40 MARLEE ROAD
PLEASANT HILL CAL

EDWARD B RAWLINS
THE COOPER BESSEMER CORP
MT VERNON OHIO

LOWELL O RAY
ALUMINUM CO OF AMERICA
2210 HARVARD AV
CLEVELAND 5 OHIO

W H RAYBURN
CONTINENTAL OIL CO
61832 PASEO
KANSAS CITY 10 MISSOURI

FREDERIC J RAYMOND
GENERAL PETROLEUM CORP
8684 PIERCE DR
BUENA PARK CAL

JAMES E READ
DUQUESNE WKS U S STEEL
5455 FLORIDA AV
BETHEL PARK PA

PROF ARNALDO RECINE
VIA VINCENZO NAZZARO 4
TORINO ITALY

DONALD J RECTOR
GRIFFITH LABS LTD
115 GEORGE ST
TORONTO ONT CANADA

EDSON A REEHL
GENERAL ELECTRIC CO
1520 NOTT ST
SCHENECTADY NEW YORK

E C REED
UNION OIL CO OF CAL
1521 NATIONAL AV
SAN DIEGO CAL

F O REED
D A STUART OIL CO LTD
2727 SOUTH TROY ST
CHICAGO 23 ILL

OSWALD REHM
CO BRASILER DE PETRO IPIRANGA
RUE SAO JOSE NO 90
RIO DE JANEIRO BRAZIL S AM

LAWTON E REID
MOBIL OIL CO
925 GRAND
KANSAS CITY MISSOURI

PAUL A REID
EATON MFG CO
35201 RUTHERFORD
MT CLEMENS MICH

ROBERT R REID
CITIES SERV OIL CO TECH SV LAB
P O BOX 718
EAST CHICAGO IND

L M REIFF
BOWSER INC
4820 BELINDER ST
SHAWNEE MISSION KANSAS

RICHARD E REINHARD
ALLIS CHALMERS MFG CO
1457 SOUTH 72ND
WEST ALLIS 14 WIS

GERALD REINSMITH
HQ ORD WEAPONS COMMAND
2111 JERSEY RIDGE RD
DAVENPORT IOWA

JOSEPH A REISING
EHRET KINSEY FARVAL
141 WEST JACKSON BLVD
CHICAGO 4 ILL

RICHARD A REISSIG
SOCONY MOBIL OIL CO INC
23 GLENDALE AV
DELMAR NEW YORK

E J REMSON JR
SHELL OIL CO
BOX 7223
RICHMOND 21 VIRGINIA

FRANCIS J RESSA
PENOLA DIV HUMBLE OIL
37 WAVERLEY LANE RT 1
ROSELLE ILL

W E RETTIG
CALIFORNIA OIL COMPANY
1200 STATE ST
PERTH AMBOY NEW JERSEY

JAMES B RETZLOFF
ETHYL CORPORATION
1600 WEST 8 MILE ROAD
DETROIT 20 MICH

THOMAS F REX
U S STEEL CORP
5700 CENTRE
PITTSBURGH 6 PA

WILLIAM U REYBOLD JR
HAVEG CORP
2ND ADAMS ST
DELAWARE CITY DELAWARE

E S REYNOLDS
SOCONY MOBIL OIL CO INC
150 EAST 42ND ST
NEW YORK 17 NEW YORK

FRANK L REYNOLDS
BRIDGEPORT BRASS CO
R F D 1 LYNN DRIVE
MONROE CONN

HARRY M REYNOLDS
RENITE COMPANY
P O BOX 8065
COLUMBUS 1 OHIO

JOSEPH R REYNOLDS
GULF OIL CORP
86 NILES DRIVE
MANCHESTER CONN

ALAN RHODES
LUBRIZOL CORPORATION
R D 4 EAGLE ROAD
WILLOUGHBY OHIO

EDWARD C RHODES
BELL TELEPHONE LABS
MURRAY HILL NEW JERSEY

PAUL H RICHARD
E I DU PONT DE NEMOURS
2406 LANSIDE DRIVE
WILMINGTON 3 DELAWARE

JOHN H RICHARDS JR
APEX ALKALI PRODUCTS CO
MAIN & RECTOR STS
PHILADELPHIA 27 PA

DON RICKETTS
AMES PETROLEUM CO
3522 ANNEAR ST
AMES IOWA

S S RICKLEY
MORGAN CONSTRUCTION CO
15 BELMONT ST
WORCESTER 5 MASS

ALLAN R RICKLOFF
GENERAL ELECTRIC CO
2901 EAST LAKE ROAD
ERIE PA

H G RIEGEL
PATE DIV HUMBLE OIL CO
40 OAKWOOD DRIVE
NAPERVILLE ILL

HERMAN E RIES JR
STANDARD OIL CO IND
BOX 431
WHITING IND

BRANDON G RIGHTMIRE
MASS INST OF TECH ROOM 35 018
CAMBRIDGE 39 MASS

H P RIGSBY
CONTINENTAL OIL CO
P O BOX 2197
HOUSTON TEXAS

CARROLL N RILL
MURPHY PHOENIX OIL CO
310 49 PINETREE RD
CLEVELAND 24 OHIO

JOHN K RILEY
H H CROSS CO
600 SOUTH MICHIGAN AV
CHICAGO ILL

MELVIN P RILEY
MAGIE BROS OIL CO
1031 WASHINGTON ST
PARK RIDGE ILL

ARTHUR D RING
MAGNUS CHEMICAL CO
RT 116 R F D
BURLINGTON UNIONVILLE CONN

VITO A RINALDO
ALEMITE CO OF BUFFALO INC
366 HERKIMER ST
BUFFALO 13 NEW YORK

ROBERT F RINSCHLER
SOCONY MOBIL OIL CO
57 PARKVIEW PLACE
BALDWIN L I NEW YORK

GEORGE RIPLEY
SAHARA OIL COMPANY
920 SPRUCE ST
ST LOUIS 2 MISSOURI

JOHN R RITCHIE JR
RITCHIE ENGINEERING CO
2910 LYNDALE AV S
MINNEAPOLIS 8 MINNESOTA

WAYNE G RITTER
RITTER ENGINEERING CO
1409 SEDGWICH ST
PITTSBURGH 33 PA

M W ROBBINS
LINCOLN ENGRG CO
1770 SOUTH 16 EAST
SALT LAKE CITY 5 UTAH

DANIEL ROBERTS
TEXACO INC
118 CORNELL ROAD
BALA CYNWYD PA

FERNAL C ROBERT
GULF OIL CORP
3 ROSEBANK DRIVE
BETHEL PARK PA

JOHN SEVERIN ROBERTS
CONTINENTAL OIL CO
1242 NORTH 28TH ST
BILLINGS MONTANA

NELSON F ROBERTS
FRANCE PACKING COMPANY
744 BROAD ST ROOM 1507
NEWARK 2 NEW JERSEY

WILLIAM L ROBERTS
U S STEEL CORP
APPLIED RESEARCH LAB
MONROEVILLE PA

M LESTER ROBINETTE
KINGSPORT EASTMAN CORP
541 DOGWOOD DR
KINGSPORT TENN

D BRUCE ROBINSON
CRANE PACKING CO
PINEWOOD COURT
BURNT HILLS NEW YORK

J H ROBINSON
INTERNATIONAL HARVESTER CO
LAGONDA AV
SPRINGFIELD OHIO

ROBERT V ROBISON
DINGLE CLARK CO
832 ENGINEERS BUILDING
CLEVELAND 14 OHIO

JOHN M ROBONIC
TAYLOR INSTRUMENT COMPANIES
95 AMES ST
ROCHESTER 1 NEW YORK

N STEWART ROBSON
TRABON ENGINEERING CORP
28815 AURORA ROAD
SOLON OHIO

ROBERT H ROBY
TIMKEN ROLLER BEARING CO
1025 CLEVELAND AV
COLUMBUS OHIO

ALBERT G ROCCHINI
GULF RES & DEV CO
P O DRAWER 2038
PITTSBURGH 30 PA

CARL O ROEDER
THE BROOKS OIL CO
928 RIDGE AV
PITTSBURGH 12 PA

MICHEL ROEGIERS
STE DES HUILES DE CAVEL & ROEG
ELEK OIL WKS RUE HAUTE 11
GHENT BELGIUM

WILFRED O ROEHRIG
SYRACUSE BEARING ROCHESTER
40 BARTON ST
ROCHESTER 11 NEW YORK

A GORDON ROGERS
IMPERIAL OIL LTD
111 ST CLAIR AV WEST
TORONTO 7 ONT CANADA

J E ROLLINS
ESSO STD OIL CO
POPLAR RIDGE ROAD RFD 2
PASADENA MARYLAND

EDWARD J RONAN
TEXACO INC
38 24 210TH ST
BAYSIDE NEW YORK

RICHARD J RONAN
TEXACO INCORPORATED
P O BOX 509
BEACON NEW YORK

M DACQUES ROQUES
ING DES ARTS ET MFGS
STA DEP CIE DE RAF SHELL BERR
42 RUE WASH PARIS FRANCE

JOHN E ROSNELL
TEXACO INCORPORATED
332 SOUTH MICHIGAN AV
CHICAGO 4 ILL

BERNARD ROSEBROUGH
MCCULLOCH CORP
9709 7TH AV
INGLEWOOD 4 CAL

BERNARD H ROSEN
CITIES SERVICE RES & DEVEL CO
BOX 402
CRANBURY NEW JERSEY

FRANK ROSEN
GEN ELECTRIC CO LUED
8899 CABOT DRIVE
CINCINNATI 31 OHIO

MILTON ROSENBERG
GEIGY CHEMICAL CORP
P O BOX 430
YONKERS NEW YORK

WILLIAM ROSENBERG
UNIVERSAL MACH CO
6110 GREENSPRING AV
BALTIMORE 9 MARYLAND

FRED ROSENSTIEHL
TEXACO INCORPORATED
135 EAST 42ND ST
NEW YORK 17 NEW YORK

FRANK ROSS
E F HOUGHTON & CO
303 WEST LEHIGH AV
PHILADELPHIA 33 PA

O B ROSSTEAD JR
AMERICAN OIL CO
5 FONT HILL DRIVE
ELLICOTT CITY MARYLAND

EDMUND ROSTKOWSKI
MILWAUKEE COUNTY INST
5290 SOUTH 43RD ST
MILWAUKEE 15 WIS

DR GEORGE J ROTARIU
BOOZE ALLEN APPLIED RES INC
1031 WAUKEGAN ROAD
GLENVIEW ILL

JAMES H ROWBOTHAM
ATLANTIC REFINING CO
P O BOX 7258
PHILADELPHIA 1 PA

CARLETON N ROWE
SOCONY MOBIL OIL CO
CENTRAL RESEARCH DIV
PAULSBORO NEW JERSEY

FRANCIS C ROWLAND
REVERE COPPER BRASS INC
24 FRONT ST
NEW BEDFORD MASS

S ROZALSKY
SHELL OIL COMPANY
BOX 262
WOOD RIVER ILLINOIS

BERNARD RUBIN
MATERIALS LAB W DEV CENTER
2916 PRINCETON DRIVE
DAYTON 6 OHIO

JOSEPH P RUCHINSKAS
CLOCK & TIMER DEPT
GENERAL ELECTRIC CO
ASHLAND MASS

F C RUDDY
INDUSTRIAL SUPPLY CO
223 CLARK
BILLINGS MONTANA

HAROLD E RUDSTROM
NORTHERN TESTING LAB INC
111 S W FIRST AV
CHISHOLM MINN

PAUL M RUEDRICH
COLLOIDAL PRODUCTS CORP
100 GATE 5 ROAD
SAUSALITO CAL

ARTHUR F RUFFNER
WAYNE CHEM PRODUCTS CO
COPELAND ST & MC RR
DETROIT 17 MICH

I W RUGE
THE PURE OIL CO
15091 LA SALLE COURT
DETROIT 38 MICH

BRYCE T RULEY
NEW DEPARTURE DIV GMC
64 HIGH ST
BRISTOL CONN

WM M RUMBERGER
TITAN METAL MFG CO
DIV OF CERRO CORP
BELLEFONTE PA

RICHARD E RUSH SR
BETHLEHEM STEEL CO
4 AVERY COURT
BALTIMORE 6 MARYLAND

DON S RUSSELL
ALOX CORPORATION
5865 N LINCOLN AV
CHICAGO 45 ILL

ING J M RUZ
COMP SHELL DE VENEZUELA DIV
DE VENTAS ENTRENAM APART 2074
CARACAS VENEZUELA SO AMERICA

EDWARD F RYAN
CHASE BRASS & COPPER CO INC
236 GRAND ST
WATERBURY CONN

ROBERT W RYAN
INTERNATIONAL BUS MACH
4962 SANDY LANE
SAN JOSE CAL

TRUXTON B RYAN
W M STILWELL CO ROOM 844
1617 PENNSYLVANIA BLVD
PHILADELPHIA 3 PA

EARLE A RYDER
CONSULTING ENGINEER
6 OAK RIDGE LAKE
WEST HARTFORD 7 CONN

RICHARD B RYDIN
AMERICAN OIL CO
910 SOUTH MICHIGAN AV
CHICAGO 80 ILL

D M SAENGER
ORONITE DIV CAL CHEM CO
40 NORMAN ROAD
STAMFORD CONN

ROBERT C SAGER
GULF OIL CORPORATION
1010 JAMES ST
SYRACUSE NEW YORK

EDWARD SAIBEL
RENSSELAER POLYTECH INST
TROY NEW YORK

ROMAN L SAILER
ASHLAND OIL & REFINING CO
ASHLAND KENTUCKY

TOSHIO SAKURAI
TOKYO INST OF TECH
OHKAYAMA MEGUROKU
TOKYO JAPAN

FRANK LOUIS SALAY
8022 SOUTH PAXTON
CHICAGO 17 ILL

GORDON W SALISBURY
DAVIS HOWLAND OIL CORP
296 PRINCETON RD
WEBSTER NEW YORK

ALBERT ROMEO SALSA
ORINOCO MINING CO
PUERTO PRDAZ ESTADO BOLIVAR
VENEZUELA SOUTH AMERICA

LEON SALZ
MAGNUS CHEM CO
SOUTH AV
GARWOOD N J

RADOVAN K SAMARDZICH
KENDALL REF CO
CASILLA NO 1987
MIRAFLORES LIMA PERU

JOHN E SAMMONS
TEXACO INC
P O BOX 2332
HOUSTON 1 TEXAS

EUGENE W SANDERS
809 MONROE ST
VALPARAISO IND

LOUIS SANETZNIK
GARVINS JERSEY FARMS INC
RD BOX 564
MARTINS FERRY OHIO

CHARLES E SANTANGELO
QUAKER CHEM PRODS CORP
106 KRAMER DRIVE
NORRISTOWN PA

JOHN K SARGENT
KERNS UNITED CORP
639 HALL ST
ALIQUIPPA PA

L B SARGENT JR
ALUM RES LABS ALUM CO OF AMER
FREEPORT RD
NEW KENSINGTON PA

ROBERT J SARRAF
ROCKWELL MFG CO
400 N LEXINGTON AV
PITTSBURGH 8 PA

M N L SASTRY
HINDUSTAN STEEL LTD
157 3RD MAIN ROAD
MALLES P O MYSORE STATE INDIA

WILLARD E SAUERBRUN
U S RUBBER CO
1230 AVE OF AMERICAS
NEW YORK 20 NEW YORK

L H SAUNDERS
WOODWARD LEMIEUX & SAUNDERS
4612 ST CATHERINE WEST
MONTREAL QUE CAN

WILLIAM B JOHN SAUNDERS
CANADIAN SKF CO LIMITED
2201 EGLINTON AV
SCARBORO ONT CANADA

WILLIAM H SAUNDERS JR
INTERNATIONAL LUBRICANT CORP
P O BOX 390
NEW ORLEANS 1 LOUISIANA

NORMAN A SAUTER
DEERE & CO
1325 3RD AV
MOLINE ILL

ARTHUR C SAWYER JR
SHELL OIL CO
624 LIVERNOIS
FERNDALE MICH

DAVID W SAWYER
ALUMINUM CO OF AMER
FREEPORT RD
NEW KENSINGTON PA

DONALD E SAYLOR
ALAN WOOD STEEL CO
CONSHOHOCKEN PA

LEE H SAYLOR
SEALED POWER CORP
2001 SANFORD ST
MUSKEGON HEIGHTS MICH

LAWRENCE G SAYWELL
EUREKA CHEM CO
512 PARROTT DR
SAN MATEO CAL

THEODORE R SCHANNEN
BOWSER INC
1302 E CREIGHTON AV
FT WAYNE 2 INDIANA

H W SCHAFER
D A STUART OIL CO
3400 W WASHINGTON BLVD
CHICAGO ILL

G WILLIAM SCHALL
STANDARD OIL CO
14 SAPPINGTON ACRES DR
ST LOUIS 23 MISSOURI

WILHELM OTTO SCHATZ
POSTFACH 176
ST MARTINSTR 20
MUENCHEN 9 GERMANY WEST

HARRY A SHAWK
COMM USNR TIDEWATER OIL CO
111 GREENBANK AV
PIEDMONT 11 CAL

HOWARD V SCHEFFEL JR
FED MOGUL BOWER BEARINGS INC
NATL SEAL DIV
REDWOOD CITY CAL

PAUL SCHEFFEL
FARM & GARDEN EQUIP
119 COLONIAL MANOR ROAD
IRWIN PA

ELIAS W SCHEIBE
DIESEL EQUIP DIV GMC
1124 NORTHWOOD N E
GRAND RAPIDS 5 MICH

JOHN SCHEIDELL
SUN OIL CO
105 BAYLOR ROAD
TRENTON NEW JERSEY

NOBLE H SCHELL
INT HARVESTER CO FT WAYNE WKS
PONTIAC & BUETER RD
FORT WAYNE INDIANA

HARVEY M SCHENCK
SIGNAL OIL CO
1918 PARK ST
ALAMEDA CAL

RAND G SCHENCK SR
FISKE BROS REF CO
614 RIDGEFIELD AV
PITTSBURGH 16 PA

FICKLIN SCHENK
BOEING AIRPLANE CO
20204 1ST PL SOUTH
SEATTLE 88 WASH

ALPHONSE SCHILLING
INST FRANCAIS DU PETROLE
20 RUE DE LA FRATERNITE
COLOMBES SEINE FRANCE

MICHAEL R SCHIMMENTI
ESSO STANDARD OIL CO
1100 RT 1
LINDEN N J

ROWELL A SCHLEICHER
BLACK BEAR CO INC
44 45 23RD ST
LONG ISLAND CITY 1 NEW YORK

ALVIN H SCHLERF
FOOD MAC CHEM COR FINE CHE DEP
1933 HILLCREST AV
BALTIMORE 7 MD

BARRET T SCHLEICHER
BLACK BEAR CO INC
SEVEN ARCHWAY PL
FOREST HILLS 75 NEW YORK

RICHARD P SCHMITZ
LUBRICATION SERVICE
P O BOX 627
KANSAS CITY 6 KANSAS

ROBERT P SCHMIDT
PENOLA OIL CO
6865 E DARTMOOR RD
BIRMINGHAM MICH

C R SCHMITT
E F HOUGHTON & CO
303 W LEHIGH AV
PHILADELPHIA 33 PA

FRED J SCHMITT
D A STUART OIL CO
2727 S TROY ST
CHICAGO 23 ILL

CARL E SCHMITZ
CRANE PACKING CO
6400 W OAKTON ST
MORTON GROVE ILL

DONALD E SCHNEIDER
SHELL OIL CO
1501 FULTON
LOUISVILLE KY

NORMAN L SCHNEIDER
OIL PRODUCTS & CHEMICALS
2601 SUMMERDALE
CHICAGO ILL

STEPHAN F V SCHOENAICH
ESSO A G
JAHNRING 25
HAMBURG 39 GERMANY

ROBERT R SHOEMAKER
GULF RES & DEV CO
355 JOSEPH ST
PITTSBURGH 27 PA

R PAUL SCHREIBER
DOW CORNING CORP
P O BOX 592
MIDLAND MICHIGAN

EHRICH E M SCHREITER
SUN OIL CO
179 HIGHLAND AV
ARLINGTON 74 MASS

JOHN J SCHRENK JR
LUBSEAL COMPANY
14438 SWANEE BEACH
FENTON MICHIGAN

WILLIAM M SCHREY
NATL TUBE DIV U S S
327 CRAFT AV
PITTSBURGH 13 PA

RAYMOND W SCHROEDER
PATE DIV HUMBLE OIL & REF CO
240 WAUKESHA AV
SUSSEX WIS

RICHARD A SCHROEDER
PURE OIL CO
159 RIDGE AV
CRYSTAL LAKE ILL

CHESTER A SCHULTE
AMERICAN LUBRICANTS CO
R R 1 BOX 716
ST LOUIS 41 MISSOURI

JACK R SCHULTE
RITTER ENGRG CO
1409 SEDGWICK ST
PITTSBURGH 33 PA

CARL H SCHULTZ
DELCO APPLIANCE DIV GMC
391 LYELL AV
ROCHESTER NEW YORK

H G SCHULTZ JR
CITIES SERV RES & DEV CO
BOX 402
CRANBURY N J

MARTIN J SCHWAB
SCHAEFFER MFG CO
102 BARTON
ST LOUIS MISSOURI

ALBERT A SCHWARTZ
GENERAL ELEC CO
BLDG 37 ROOM 1020
SCHENECTADY 1 NEW YORK

ROBERT T SCHWARTZ
MAT LAB WRIGHT AIR DEV CENT
333 E DIXON AV
DAYTON 19 OHIO

HERBERT SCHWENKER
WRIGHT PATTERSON AF BASE
87 MEEHAN DR
DAYTON 31 OHIO

ARTHUR DONALD SCHWOPE
CLEVITE
540 EAST 105TH ST
CLEVELAND 8 OHIO

ALEXANDER R SCOTT
STEEL CO OF CAN LTD
525 DOMINION ST
MONTREAL QUE CANADA

ERNEST H SCOTT
UNITED SHOE MACH CORP RES DIV
BALCH ST
BEVERLY MASS

JAMES W SCOTT
81 LANGFORD RD
ROCHESTER 15 NEW YORK

J J SCOTT
BOUND BROOK BEAR CORP OF AMER
BOUND BROOK NEW JERSEY

VERNON L SCOTT
PURE OIL COMPANY
1306 SOUTH 1ST ST
MINNEAPOLIS MINNESOTA

ROBERT D SCOVILL
RAWDON MYERS AGENCY
1942 SELMA ROAD
SPRINGFIELD OHIO

ORVIS V SCUDDER
ALUM CO OF AMER
RIVER RD
EDGEWATER N J

R C SEEBURGER JR
HUGHES AIRCRAFT CO
7415 304 SEPULVEDA BLVD
LOS ANGELES 45 CAL

C L SEELBACH
SHELL OIL CO
50 W 50TH ST
NEW YORK 20 N Y

BEN SEGAL
QUALITY OIL CORPORATION
6630 HUTCHISON
MONTREAL 8 QUE CANADA

EDMUND H SEJMAN
SUN OIL CO
55 MARLBORO DRIVE
MILFORD CONN

JACQUES SEJOURNET
CEFILAC
30 AVENUE DE MESSINE
PARIS 8E FRANCE

H L SELLERS
SHELL OIL CO
801 BRANDT ST
DAYTON 4 OHIO

CHARLES SENEDAK
38 KLEBER AV
YOUNGSTOWN 9 OHIO

WILLIAM F SENTER
ACHESON COLLOIDS CO
12 INTERVALE ROAD
NEEDHAM MASS

AL SEQUIN
CAN TUBE & STEEL PR STOW SCREW
5870 PATRICK
MONTREAL QUE CANADA

ERNEST SEWELL JR
PHILLIPS PETR CO SALES DEPT
BARTLESVILLE OKLA

BERNARD J SEXAUER
AMERICAN BRAKE SHOE CO
9353 DUENKE DRIVE
ST LOUIS 37 MISSOURI

CECIL E SHADBURN
GA CAROLINA OIL CO
570 FOREST AV
MACON GEORGIA

L LYNN SHAFFER
J N FAUVER CO
727 W KEMPER RD
CINCINNATI 40 OHIO

T F SHAFFER
SHELL OIL CO
50 W 50TH ST
NEW YORK 20 N Y

CARL SHANKS
PANTHER OIL & GREASE MFG
P O BOX 711
FORT WORTH 1 TEX

F P SHAPIRO
ALOX CORPORATION
10 ELLSWORTH AV
YONKERS NEW YORK

ROBERT Q SHARPE
SOCONY MOBIL OIL CO INC
150 EAST 42ND ST
NEW YORK 17 N Y

JOHN J SHATYNSKI
CELANESE CORP OF AMER
MORRIS COURT
SUMMIT N J

MILTON C SHAW
MASS INST OF TECH ROOM 1 123
CAMBRIDGE 39 MASS

VANDOS SHEDIGIAN
GENERAL ELECTRIC CO
913 25TH ST
WATERVLIET NEW YORK

JULIAN B SHEALY
WARREN REF CHEM CO
260 DELAWARE AV
BUFFALO 2 NEW YORK

JEANIE S SHEARER
INTERNATIONAL HARVESTER
654 WEST ROAD
LOMBARD ILL

TED R SHEARER
NELSEN STEEL & WIRE CO
9400 W BELMONT AV
FRANKLIN PARK ILL

TOM J SHEFFIELD
HYDROTEX INDUSTRIES
4333 N CENTRAL EXPWY
DALLAS 21 TEXAS

PAUL R SHEPLER
KOPPERS CO INC METAL PROD DIV
BUSH & HAMBURG STS
BALTIMORE MD

ODEN E SHEPPARD
BOEING AIRPLANE CO
11527 DURLAND N E
SEATTLE 55 WASHINGTON

ROBERT G SHERET
REYNOLDS METALS CO
BOX 13
WADDINGTON NEW YORK

JOHN J SHERLOCK
NATL CARBON CO UCC
2295 LOYOLA ROAD
UNIVERSITY HEIGHTS 18 OHIO

WILBUR W SHERMAN
D A STUART OIL CO
6635 W GRANT ST
WEST ALLIS 19 WIS

JOHN EDWARD SHIFFLER
NATL REF CO
1728 TIFFANY LAKE
CINCINNATI 30 OHIO

JOHN J SHIGLEY
INTERNATIONAL HARVESTER CO
610 W HARDING RD
SPRINGFIELD OHIO

WHILMER SHINN
FAIRLESS WKS U S STEEL
FAIRLESS HILLS PA

EUGENE E SHIPLEY
GEN ELEC CO
LIBERTY ST
MIDDLETON MASS

WILLIAM H SHIPPEE
SHELL OIL CO
2808 STANBRIDGE AV
LONG BEACH 15 CAL

NORMAN E SHIRK
SCOVILL MFG CO
STEINMAN AV R F D
MIDDLEBURY CONN

HENRY B SHORTLEY
WESTERN ELECTRIC CO
2500 BROENING HIGHWAY
BALTIMORE 24 MARYLAND

JOHN H SHROYER JR
THE LUBRIZOL CORP
320 ENTERPRISE BLDG
TULSA 3 OKLA

WILLIAM W SHUGARTS JR
FRANKLIN INST LABS
20TH & PKWY
PHILADELPHIA 3 PA

JAMES H SHULTZ
POLY CHEM INC
541 SOUTH WEBSTER
INDIANAPOLIS 19 INDIANA

RALPH L SHUMAN
CLEVELAND GRAPH BRONZE
RD 1
MOUNDSVILLE W VA

LEWIS R SIBLEY
BATTELLE MEM INST
505 KING AV
COLUMBUS 1 OHIO

OLEN D SICKELER
SPANG CHALFANT CO
DUSS AV
AMBRIDGE PA

H K SIEFERS
UNITED OIL CO
1800 N FRANKLIN ST
PITTSBURGH 30 PA

LEON A SIEGEL
WESTINGHOUSE ELEC CORP
7005 CONCORD RD
BALTIMORE 8 MD

WALTER R SIEGER
ATLANTIC REF CO
260 S BROAD ST
PHILADELPHIA 1 PA

FRANK X SIELOFF
LUBRIZOL CORP
32036 RED CLOVER RD
FARMINGTON MICH

WM A SIEMON
MAHONING VAL SUPPLY CO
704 YOUNGSTOWN POLAND
YOUNGSTOWN 12 OHIO

PHILIP R SIGLER
CITIES SERVICE RES & DEV
BOX 402
CRANBURY NEW JERSEY

WILLIAM D SIGNER JR
ACHESON COLLOIDS CO
132 MEADOWBROOK RD
ROCHESTER 20 NEW YORK

EARL SILLETT
CAN WESTINGHOUSE CO LTD
SANFORD AV RES DEV LABS
HAMILTON ONT CANADA

JOSEPH J SILVERSTEIN
ORE LUBE CO
11 FRONT ST
NEW YORK 4 N Y

K EDWARD SIMMINGER
BOWSER INC
225 W LEHIGH AV
PHILADELPHIA 33 PA

HARRY D SIMON
TOWER OIL CO
300 W WASHINGTON ST RM 912
CHICAGO 6 ILL

RUPERT SIMMONS
CONTINENTAL OIL CO
HOUSTON TEXAS

JOHN SIMON
NATL WKS USS
1105 IVY ST
MCKEESPORT PA

JOHN N SIMONS
SUN OIL CO
505 MERIWETHER AV
RICHMOND 22 VA

W KING SIMPSON
ELECTRO MOTIVE DIV GMC
400 DOVER AV
LA GRANGE ILL

HARRY E SIMS
ESSO EXPORT CORP
24 ELM PLACE
NEW CANAAN CONN

CARL W SINCLAIR
SALES ENGRG CO INC
875 LEGRAND ST
SALT LAKE CITY 8 UTAH

R M SINCLAIR
BRIT AMER OIL CO LTD
800 BAY ST
TORONTO ONT CANADA

JOSEPH J SIRAGUSA
423 ARSENAL ST
WATERTOWN NEW YORK

ALF S SKAUG
A S NORSKE ESSO
PRINSENSGT 3 A
OSLO NORWAY

JOHN T SKEHAN
E I DU PONT DE NEMOURS CO
P O BOX 1671 PETROLEUM LAB
WILMINGTON 99 DEL

JOHN SKOLNY
EASTMAN KODAK CO
1047 CHERRY HILL LANE
WEBSTER NEW YORK

JOSEPH P SKYRUS
STEPHAN CHEM CO
4208 W MELROSE ST
CHICAGO 41 ILL

JOHN B SLACK
REFILL FILTER CO
541 15TH AV
NEWARK 3 N J

PHILIP J SLATTERY
VISCOSITY OIL CO
3200 SOUTH WESTERN AV
CHICAGO 8 ILL

ROBT R SLAYMAKER
CASE INST OF TECH
10900 EUCLID AV
CLEVELAND 6 OHIO

HAROLD E SLINEY
NASA LEWIS RESEARCH CENTER
19237 STOCKTON AV
MAPLE HEIGHTS 37 OHIO

I R SLINGERLAND
UNITED CO OPERATIVES INC
506 WEST ELY ST
ALLIANCE OHIO

H J SLIWA
IND PROD DEPT SHELL OIL CO
P O BOX 6870
BALTIMORE 4 MD

CLYDE A SLUHAN
MASTER CHEM CORP
M O BOX 857
TOLEDO 1 OHIO

CALVIN V SMALHEER
LUBRIZOL CORP
BOX 3057 EUCLID STATION
CLEVELAND 17 OHIO

B L SMALLEY
L R KERNS CO
8940 S BELL AV
CHICAGO 43 ILL

KENNETH S SMILEY
E I DU PONT DE NEMOURS
MARLTON ROAD R D 2
WOODSTOWN NEW JERSEY

WILLIAM C SMILEY
THE PURE OIL CO
1716 OBERLIN CT N W
CANTON OHIO

BENJAMIN GEORGE SMITH
CITIES SERV OIL CO
6416 BLENHEIM RD
BALTIMORE 12 MD

BRAINARD M SMITH
FISKE BROS REF CO
5270 SHERIDAN DR
WILLIAMSVILLE NEW YORK

BRUCE A SMITH
MANUFACTURING STAFF GEN MOTORS
G M TECHNICAL CENTER
WARREN MICH

CHARLES J SMITH
CITIES SERV OIL CO
3435 BROADWAY
KANSAS CITY MO

COLIN FREDERICK SMITH
ROLLS ROYCE LTD
1 DEVONSHIRE DRIVE
MICKLEVER DERBY ENGLAND

DALE F SMITH
MONSANTO CHEMICAL CO
800 NORTH LINDBERG BLVD
ST LOUIS 66 MISSOURI

F L SMITH
PHILLIPS PETR CO
6471 PARK AV
INDIANAPOLIS 20 IND

GEORGE L SMITH
C H CLARK OIL CO
2461 NOBLE RD
CLEVELAND HEIGHTS 21 OHIO

GEORGE W SMITH
E F HOUGHTON & CO
330 WYLESWOOD DR
BEREA OHIO

HAMILTON W SMITH
GOLDEN BEAR OIL CO
325 W 8TH ST
LOS ANGELES 14 CAL

HARLAN M SMITH
ESSO RES & ENGRG COMPANY
P O BOX 51
LINDEN NEW JERSEY

HARRY F SMITH
CONTINENTAL OIL CO
400 W MADISON ST ROOM 800
CHICAGO 6 ILL

HOWARD J SMITH
CHASE BRASS & COPPER CO
236 GRAND ST
WATERBURY CONN

JAMES H SMITH
SMITH WEIHMAN CO INC
15 MOORE ST
NEW YORK 4 N Y

JAMES H SMITH JR
COLUMBIA GENEVA STEEL
PITTSBURG CAL

J D SMITH
INTERNATIONAL LUB CORP
P O BOX 390
NEW ORLEANS 1 LA

J ROY SMITH
METROP TRANS AUTHORITY
7 CRAIGIE CIRCLE
CAMBRIDGE MASS

MELVIN I SMITH
SOCONY MOBIL OIL CO INC
47 PARK LANE
ROCKVILLE CENTER L I NEW YORK

PHILIP GRAHAM SMITH
OAK RIDGE NATIONAL LAB
POST OFFICE BOX Y
OAK RIDGE TENN

RICHARD C SMITH
J H RAE OIL CO INC
10 AMBROSE ST
ROCHESTER 18 NEW YORK

RICHARD J SMITH
MC GILL MFG CO INC
909 LAFAYETTE
VALPARAISO IND

R KENNEDY SMITH
ELCO LUBRICANT CORP
JENNINGS & DENNISON RD
CLEVELAND 9 OHIO

ROBERT J SMITH
PLUME & ATWOOD MFG CO
EAST MAIN
THOMASTON CONN

RUSSELL SMITH
NOPCO CHEM CO
37 WENDY ROAD
COLONIA NEW JERSEY

THOMAS C SMITH
ESSO STD E REG DV HU OIL & REF
127 PROSPECT ST
WAKEFIELD MASS

VICTOR W SMITH
G W SMITH & SONS INC
1700 SPAULDING RD
DAYTON 32 OHIO

WARREN H SMITH
FARMERS UN ST EX LUB OIL PLANT
MPO BOX 986 DOWNTOWN STATION
OMAHA NEBRASKA

WILLIAM SMITH
STEEL CO OF CAN LTD
WILCOX ST
HAMILTON ONT CANADA

WILLIAM H SMITH
FISKE BROS REFINING CO
831 FOREST APT B 1
EVANSTON ILL

WILLIAM J SMITH
THE PURE OIL CO
200 EAST GOLF ROAD
PALATINE ILL

WILLIAM L SMITH
SINCLAIR REFINING CO
9300 LEDBURY ROAD
RICHMOND 29 VIRGINIA

JESS P SMITHER
D A LUBRICANT CO INC
1331 W 29TH ST
INDIANAPOLIS 23 INDIANA

GEORGE D SMITTLE
GRANDVIEW ESTATES
P O BOX 2067
WINTERSVILLE OHIO

RICHARD A SMUCKER
GULF OIL CORP
970 JONES DR
SALEM OHIO

JOHN F SNIDER
STD OIL CO OF CAL
722 N PARISH PLACE
BURBANK CAL

CHARLES E SNODDERLY
ESSO STD OIL CO
138 HYDE PKWY
PALMYRA NEW YORK

ALFRED SONNTAG
THE ALPHA MOLYKOTE CORP
65 HARVARD AV
STAMFORD CONN

R R SNYDER
TEXACO INC
4104 VIA PICAPOSTE
PALOS VERDES ESTATES CAL

CHAS H SNYDER
NATL REF CO
577 MALVERN RD
AKRON 3 OHIO

EDWARD L SOBOL
BROOKS OIL CO
2232 S 6TH AV
NORTH RIVERSIDE ILL

ELMER J SODWITH
89 WESTERN DRIVE
LAKEWOOD NEW JERSEY

CHARLES H SOHN
SOCONY MOBIL OIL CO
26 BROADWAY ROOM 1465
NEW YORK 4 NEW YORK

DONALD W SOLIS
CITIES SERV OIL CO
63 FRIAR TUCK LANE
SPRINGDALE CONN

BEN SOLLITTO
PENN REF CO
2686 LISBON RD
CLEVELAND 4 OHIO

SAMSINGH KELVIN SOLOMON
16 WICKREMARATHNA AV
KOHUWELA NUGEODA
CEYLON INDIA

WILLY SONNTAG
VDI VDEH ASLE NOT MOLLE & SONN
SCHMIERUNG REMBRANDTSTRABE 19
DUSSELDORF GERMANY

RABINDER NATH SOOD
CALTEX INDIA LTD
A 20 21 NIZAMUDDIN EAST
NEW DELHI INDIA

P A SORENSON
RICHFIELD OIL CORP
16645 AKRON ST
PACIFIC PALISADES CAL

SERGE J SOROKA
ESSO STD DIV OF HUMBLE OIL
5200 JEAN ST
VERONA PA

WALTER C SPAIN
STD OIL CO OF IND
2035 N MILDRED AV
DEARBORN 7 MICH

CLAUDE E SPAINHOUR
CROSSETT PAPER MILLS
CROSSETT ARKANSAS

LEO SPALDING
BALCRANK INC
CINCINNATI 9 OHIO

DAVID C SPAULDING JR
BUNTING BRASS & BRONZE
3622 BEECHWAY BLVD
TOLEDO 14 OHIO

STANLEY E SPARKS
VISCOSITY OIL CO
3200 SOUTH WESTERN AV
CHICAGO 8 ILL

GEORGE G SPEHN
1037 W NORTH SHORE AV
CHICAGO 26 ILL

ALFRED CHARLES SPENCER JR
ESSO STD DIV HUM OIL & REF CO
1 MOUNTAINVIEW TERRACE
MAPLEWOOD NEW JERSEY

WALTER A SPERKS
D O JAMES GEAR MFG CO
5438 NORTH LAMON AVE
CHICAGO ILLINOIS

M H SPERLING
RICHFIELD OIL CORP
1709 MILAN AV
SOUTH PASADENA CAL

B G SPICE
ALOX CORP
7907 LAMON ST
SKOKIE ILL

WALTER C SPIESS
SPERRY GYROSCOPE CO
GREAT NECK L I N Y

ROSCOE C SPOONER
ARCHER DANIELS MIDLAND CO
29TH AV SE & CG W RR
MINNEAPOLIS MINNESOTA

S L SPRADLING
M F A OIL CO
COLUMBIA MO

GEORGE G W SPRATT
BA OIL CO LTD
105 MASTERSON DRIVE
ST CATHARINES ONT CANADA

BERTOLD SPRENGER
SIEMAG SIEGENER MASCHINEN GMBH
SCHWEISFURTH 10
DAHLBRUCH SIEGEN GERMANY

EARL ROBERT SPRINGSTEAD
HUMBLE OIL & REFINING CO
PREVOST 19977
DETROIT 35 MICH

NUMAN F SQUIRE
ALDRIDGE IND OILS INC
317 N MILES RD
CHAGRIN FALLS OHIO

ARTHUR H STAFFON
SOCONY MOBIL OIL CO INC
185 SPRING ST
ARLINGTON 74 MASS

JAMES G STAFFORD
RALPH SHRADER INC
1141 SPRINGWELLE AV
DETROIT 9 MICH

JOHN W STACK
201 S GARDEN CIRCLE
DUNEDIN FLA

P RAYMOND STAINES
DAVISON CHEM CO
200 AVONDALE CIRCLE
SEVERNA PARK MD

STANLEY L STALSON
AM STEEL & WIRE DIV USS
4042 STREETSBORO RD
WEST RICHFIELD OHIO

LOUIS J STANKIEWICZ
ROCKETDYNE
8368 MAYNARD AV
CANOGA PARK CAL

NORMAN R STANLEY
H G DAVIS INC
4 COLONIAL HILL DR
WEST BOYLSTON MASS

HERBERT T STANNER
VISCOSITY OIL CO
3200 SOUTH WESTERN AV
CHICAGO 8 ILL

LOUIS A STANZIONE
BETHLEHEM STEEL CO
CAMPBELL ST
WILLIAMSPORT PA

EDRIC P STARBIRD
ESSO STD OIL CO
55 HADLEY ST
SPRINGFIELD MASS

LOUIS R STARK
MONSANTO CHEM CO
1700 S 2ND ST
ST LOUIS 77 MISSOURI

W W STARK
SINCLAIR REFINING CO
P O BOX 37 POWDERLY STA
BIRMINGHAM 11 ALA

F W STARKEY
MARLEY CO
5812 MARTY
MISSION KANSAS

PAXTON B STARKSEN
KOBE INCORPORATED
3040 EAST SLAUSON
HUNTINGTON PARK CAL

ROBT L STEDFELD
MACHINE DESIGN
PENTON BLDG
CLEVELAND 13 OHIO

FINLEY M STEELE
HILLIARD CORP
102 S 4TH ST
ELMIRA NEW YORK

VARIAN STEELE
IND BEARING CORP
50 FORDHAM DRIVE
BUFFALO 16 NEW YORK

JOHN STEHM
NATL LEAD CO TITANIUM DIV
P O BOX 58
SOUTH AMOBY N J

G E STEINMETZ
R D 2
BELLE CENTER OHIO

PETER J STEPHENS
ESSO STD OIL CO
35TH ST & A V R R
PITTSBURGH 1 PA

EDNA M STERLING
RICHFIELD OIL CORP
555 S FLOWER ST
LOS ANGELES 17 CAL

HELMUT F STERN
INDUSTRIAL TECTONICS
ANN ARBOR MICH

BENO STERNLICHT
GEN ELEC CO
1108 MERLIN DRIVE
SCHENECTADY NEW YORK

HENRY EDGAR STEVENS
STD OIL CO INDIANA
360 ELM ST
GLEN ELLYN ILL

JUSTUS B STEVENS
SEALOL CORP
P O BOX 2158
PROVIDENCE 5 R I

GEORGE RUSSELL STEVENSON
JAMES T GORDON CO
233 BROADWAY
NEW YORK 7 N Y

J W STEVENSON
MOB OIL CO DIV SOC MOB OIL CO
RT 1 BOX 215
SEABROOK TEXAS

WM E STEVENSON JR
PAN TECH ENGRG & SUP CO
3230 MERCER
HOUSTON 27 TEXAS

WM E STEVENSON SR
STEVENSON OIL & CHEM CO
30130 LAKELAND BLVD
WICKLIFFE OHIO

DAVID L STEWART
MOBIL OIL CO
819 EAST 48TH ST
KANSAS CITY MISSOURI

JAMES KEMBER STEWART
SHELL OIL CO OF CAN LTD
247 MERTON AV
ST LAMBERT QUE CANADA

JOHN ALBERT STICH
GULF OIL CORP
2136 N 60TH ST
MILWAUKEE 8 WIS

T F STIFFLER
STIFFLER IND LUB CO
RT 8 BOX 265
ALLISON PARK PA

WILLIAM MOORE STILWELL 111
CLIMAX MOLYBDENUM COMPANY
1270 6TH AV
NEW YORK 20 NEW YORK

WM M STILWELL JR
W M STILWELL CO
1617 PA BLVD ROOM 844
PHILADELPHIA 3 PA

W H STIMSON
PHILLIPS PETR CO
68 S MAIN
SALT LAKE CITY UTAH

RICHARD F STIMER
NEW PROC GEAR DIV CHEVY CORP
120 WEST ROSWELD
NEDROW NEW YORK

FRED E STOCKWELL
40 ELMWOOD ROAD
NEW HAVEN 15 CONN

HATHERLEY A STODDARD JR
GULF OIL CORP
389 FOREST AV
SWAMPSCOTT MASS

JAMES STODDART
CANADA CEMENT CO LTD
PHILLIPS SQUARE
MONTREAL QUE CANADA

ALFRED F STOEHR
CITIES SERV OIL CO
3818 BOWEN
ST LOUIS 16 MISSOURI

C W STOLL
SINCLAIR REF CO
ROCK HILL MOCKINGBIRD VALL RD
LOUISVILLE 7 KY

FLOYD O STOLLSTEIMER
SUN OIL CO
31 SPARKS ST
TROTWOOD OHIO

THOMAS M STONEROD
BROOKS OIL CO
R D 1
BADEN PA

GARY STORY
SHELL OIL CO
1073 OCEAN AV
BAYSHORE L I NEW YORK

GEORGE W STOUT
MEAD CORP
297 CALDWELL
CHILLICOTHE OHIO

ERIC F STRANDBERG
AB WESTIN & BACKLUND
BOX 9033
STOCKHOLM SWEDEN

EUGENE O STRAUSS
OIL PROD & CHEM DIV NATL ALUM
9165 HARBOR
CHICAGO 17 ILL

KURT H STRAUSS
TEXACO INCORPORATED
116 HOOKER AV
POUGHKEEPSIE NEW YORK

WINSLOW J STRINGER
SUN OIL CO
506 RIDGEVIEW RD
ORANGE CONN

ROBERT J STROBER
WHEELING STEEL CORP
BOX 547 BOGGS RUN RD
BENWOOD W VA

EDWIN M STROM JR
JOS DIXON CRUCIBLE CO
167 WAYNE ST
JERSEY CITY N J

WALTER A STRZALKOWSKI
CHEM OIL PRODUCTS
16958 EAST JANINE DR
WHITTIER CAL

CARL B STUART
SHELL OIL CO
4512 KIRK RD
YOUNGSTOWN OHIO

CARL STUEBE
LUBRIZOL CORP
EUCLID STATION
CLEVELAND 17 OHIO

BERNARD C STUPP
HOHMAN PLATING & MFG CO
2680 LITTLE YORK RD
DAYTON 5 OHIO

A C STUTSON
SOCONY MOBIL OIL CO INC
150 E 42ND ST
NEW YORK 17 N Y

LOUIS H SUDHOLZ
SOCONY MOBIL OIL CO INC
208 06 RICHLAND
FLUSHING 64 N Y

JOSEPH S SUGHROUE
SMITH OIL & REF CO
1102 KILBURN AV
ROCKFORD ILL

EDMUND SULIKOWSKI
AM WATERLOCK CO INC
452 TANVIEW DR
OXFORD MICH

F J SULLIVAN
UNIV OF MAINE
DEPT OF MECH ENGR
ORONO ME

GEORGE E SULLIVAN
WAYNE CHEM PROD CO
9470 COPLAND
DETROIT 17 MICH

GEORGE L SUMNER JR
ALEMITE CO OF PITTSBURGH
609 12TH ST
OAKMONT PA

JOHN W SWAIN JR
MERGRAF OIL PRODUCTS INC
P O BOX 215
NORTHVILLE MICH

ARTHUR G SWAVELY
ASHLAND OIL & REF CO
1409 WINCHESTER AV
ASHLAND KY

CARL A SWANSON
ESSO STANDARD
8 GREENBRIAR LANE
NEWTOWN CONN

R F SWANSON
N Y CENTRAL R R
577 E 152ND ST
CLEVELAND 10 OHIO

R A SWENSON
STD OIL CO OF IND
P O BOX 431
WHITING IND

DONALD A SWERDFIGER
AIRESEARCH INDUSTRIAL DIV
871 GLENWAY DR APT 1
INGLEWOOD 8 CAL

ANDREW SWIEC
CROWN CORK & SEAL CO
609 E 29TH ST
BALTIMORE 18 MD

MAX A SWIKERT
NACA LFFL
SNELL RD
COLUMBIA STATION OHIO

J THOMAS SYDNOR JR
ESSO STD OIL CO
LYNCHBURG VA

D S TABER
SOCONY MOBIL OIL CO
606 VANDALIA
ST PAUL 14 MINNESOTA

H E TABER
LUBSEAL CO
33658 LAKE ROAD
AVON LAKE OHIO

LEO TACHOIR
TIDE WATER ASSOC OIL CO
1509 ARROTT BLDG
PITTSBURGH 22 PA

S K TALLEY
SHELL DEVELOPMENT CO
4560 HORTON ST
EMERYVILLE 8 CAL

ROBERT W TAPPIN
MORGAN CONST CO
15 BELMONT ST
WORCESTER 5 MASS

ZALA CROMER TATTON
CALTEX OIL AUSTRALIA PTY LTD
167 KENT ST
SYDNEY AUSTRALIA

EARL W TAYLOR
BARDAHL OIL CO
2503 A WARWICK RD PO BX 1562
NEWPORT NEWS VA

GEORGE F TAYLOR JR
TAYLOR OIL CO
P O BOX 1414
SOMERVILLE N J

GEORGE F TAYLOR 111
CITIES SERV OIL CO
34 DEER RUN DR R D 5
SOMERVILLE NEW JERSEY

WALTER E TEAGUE
RICHFIELD OIL CORP
645 S MARIPOSA
LOS ANGELES CAL

RALPH TENHAEFF
SALES ENGINEERING CO INC
841 S 5TH ST EAST 12
SALT LAKE CITY UTAH

JOHN R TERHUNE
JENKINS GUERIN INC
7521 ROSEDALE DR
PASADENA PARK MO

JAMES E THALMAN
WHEELING STEEL CORPORATION
STEUBENVILLE WORKS
STEUBENVILLE OHIO

LEWIS R THARP
E F HOUGHTON & CO
4500 EUCLID AV
CLEVELAND 3 OHIO

PETER THATCHER
STD OIL CO OF CALIF
729 SPRUCE ST
BERKELEY 7 CAL

DUDLEY P THOMAS
COL GENEVA STEEL GENEVA WORKS
BOX 510
PROVO UTAH

F DARRELL THOMAS
SUN OIL CO
5040 CHANTILLY DR
CINCINNATI 38 OHIO

JOHN P THOMAS
SHELL OIL CO
322 WELLINGTON RD
DELMAR NEW YORK

STANLEY CLIFFORD THOMAS
CR 122 DAYS ROAD
ORANGE
BISBANE QUEENSLAND AUSTRALIA

WILLIAM E THOMAS
UNION CARBIDE NUCL CO
P O BOX Y BLDG 9201 3
OAK RIDGE TENN

MILTON O THOMMESEN
SOCONY MOBIL OIL CO
2348 N 120TH ST
WAUWATOSA 10 WIS

DAVID S THOMPSON
CANFIELD OIL CO
3463 EWALD CIRCLE
DETROIT 4 MICH

DONALD LEE THOMPSON
CINCINNATI VULCAN OIL CO
95 WAMSLEY AV
CLEVES OHIO

EDISON R THOMPSON
G WHITFIELD RICHARDS
23 N SPRING GARDEN ST
AMBLER PA

JOSEPH EDWARD THOMPSON
ATLANTIC REFINING CO
223 DU PONT
RIDLEY PARK PA

KENNETH G THOMPSON
CASTROL OILS CANADA LTD
1540 LAKESHORE RD
TORONTO 14 ONT CANADA

PAUL F THOMPSON
CARLISLE CHEMICAL WORKS INC
WEST ST
READING 15 OHIO

RICHARD S THOMPSON
SUN OIL CO
502 PAPERMILL RD
ORELAND PA

ROBERT W THOMPSON
C L THOMPSON CO
2411 NORTH 119TH ST
WAUWATOSA 13 WIS

W R THOMPSON
GULF OIL CORP
721 DEVINIAN DRIVE
MIDLAND TEXAS

ARTHUR F THORBURN
SHELL OIL CO OF CANADA
P O BOX 430 STA B
MONTREAL QUE CANADA

ARTHUR I THUREN
MAGIE BROS OIL CO
9101 FULLERTON
FRANKLIN PARK ILL

L M TICHVINSKY
UNIV OF CALIF
BERKELEY 4 CAL

JAMES B TIERMAN
LUBR DIV OF FISKE BROS REF CO
P O BOX 43
KITTREDGE COLO

BURTON E TIFFANY
FORD MOTOR CO
11832 OHIO
DETROIT 4 MICH

H E TIFFANY JR
SUN OIL CO
1608 WALNUT ST
PHILADELPHIA 3 PA

RICHARD A TILGHMAN
CLIMAX MOLYBDENUM COMPANY
1270 6TH AV
NEW YORK 20 NEW YORK

C O TINDALL
NATL SEAL DIV
BROADWAY AT NATIONAL AV
REDWOOD CITY CAL

C ALVAN TITCOMB
SHELL OIL CO
P O BOX 1313
BALTIMORE 3 MD

ANDREW C TODARO
COLO FUEL & IRON CO
407 WEST 38TH ST
WILMINGTON 2 DELAWARE

P V TOFFOLI JR
THE PURE OIL CO
200 EAST GOLF ROAD
PALATINE ILL

HENRY Y TOLAND
ALEMITE CO OF EASTERN PA
704 NORTH 16TH ST
PHILADELPHIA 30 PA

JOSEPH TOMKO
METAL LUBRICANTS CO
3535 SOUTH OAKLEY
CHICAGO 9 ILL

HAROLD F TOMPKINS
R T VANDERBILT CO INC
33 WINFIELD ST
NORWALK CONN

ROY K TONNING
AMER CAN CO EQUIP DIV
396 BEVERIDGE RD
RIDGEWOOD N J

GEORGE J TOPOL
S F BOWSER CO LTD
344 SHERMAN AV N
HAMILTON ONT CANADA

M ALFRED TORBIN
MASON OIL CO INC
1671 MONOCHELA AV
PITTSBURGH 18 PA

FELIX A TORNATORE
TIDEWATER OIL CO
2102 GRANT BOULEVARD
SYRACUSE 8 NEW YORK

JOHN TORSOK
PURE OIL CO
2360 CALEDONIA
TOLEDO 1 OHIO

ROBERT J TORRENS
EASTMAN KODAK CO
KODAK PARK
ROCHESTER NEW YORK

F L TOWNSEND
WM W NUGENT & CO
336 WESLEY AV
EVANSTON ILL

C E TRAUTMAN
GULF RES & DEV CO
P O DRAWER 2038
PITTSBURGH 30 PA

GORDON TRAVERS
NORDBERG MFG CO
3073 S CHASE
MILWAUKEE 7 WIS

ISAAC TRIPP 111
ETNA PRODUCTS INC
305 SYLVAN DR CHAGRIN HEIGHTS
CHAGRIN FALLS OHIO

ROBERT T TRITES
EMERY INDUSTRIES INC
4900 ESTE AV
CINCINNATI 17 OHIO

HAROLD TROIKE
11137 BOEGER CT
WESTCHESTER ILL

ALBERT J TROMPIER
CIE GEN DU DURALUM ET DU CUIV
19 SQ CLIGNACOURT
PARIS 18 E FRANCE

MERVIN F TROUTMAN
ESSO STD OIL CO
89 CEDAR PLACE
WAYNE N J

H M TROWBRIDGE
SHELL OIL CO
35 HAYWARD COURT
MARTINEZ CAL

JOHN J TROY
CITIES SERV OIL CO PA
133 DEWEY AV
PATERSON 2 N J

JOHN F TRUMPOUR
SHELL OIL CO
9840 ANDREWS
ALLEN PARK 10 MICH

WILLIAM TUNNEY JR
ST JOSEPH LEAD CO
1020 MAPLEWOOD AV
AMBRIDGE PA

M H TURBEAU
STE DES HUILES LABO
104 RUE DE MIROESNIL
PARIS 8 FRANCE

J STANLEY TURPIN
TENN EASTMAN CORP
245 DELEE DR
KINGSPORT TENN

A H TURNER
STANDARD OIL CO OHIO
MIDLAND BLDG
CLEVELAND 15 OHIO

EDWARD A TURNER
CARBORUNDUM CO
BUFFALO AV BLDG 73 3
NIAGARA FALLS NEW YORK

FRANK F TWAROG
E F HOUGHTON & CO
P O BOX 426
NORTH OXFORD MASS

SUMNER B TWISS PRES
CYCLE CHEM PROD DIV CHRYS CORP
5437 W JEFFERSON
TRENTON MICH

ALFRED B TWO
MOTOR OILS REF CO
3219 S WENONAH AV
BERWYN ILL

PETER W UHL
DETROIT ARSENAL
12003 MARION
DETROIT 39 MICH

RICHARD D UHL
E F HOUGHTON & CO
401 BESSEMER BLDG
PITTSBURGH 22 PA

ROBT K ULRICH
BETHLEHEM STEEL CO
FRONT ST
STEELTON PA

ERNST UMHOFER
THEO KLUBER MINERALOLFABRIK
BREISACHERSTRASSE 6
MUNICH 8 GERMANY

L T UNKS
SUN OIL CO
P O BOX 1607
CINCINNATI 1 OHIO

CLARENCE N URSEM
F & W URSEM CO
1548 W 117TH ST
CLEVELAND 7 OHIO

WM A URSEM
F & W URSEM CO
1548 W 117TH ST
CLEVELAND 7 OHIO

RALPH F URSO
MC CORD CORP
2507 E GRAND BLVD
DETROIT 11 MICH

JAMES WM USSHER
BRIT AMER OIL CO
1945 GRAHAM BLVD
TOWN OF MT ROYAL QUE CANADA

ORVILLE H UTLEY
S W PETR CO
P O BOX 789
FT WORTH TEXAS

STEPHEN A VAGO
THE B F GOODRICH CO
500 SOUTH MAIN ST
AKRON OHIO

E JAMES VARGO
CLEVELAND GRAPHITE BRONZE
17000 ST CLAIR AV
CLEVELAND 10 OHIO

JOE VALENCE
INTERNATL HARVESTER CO
7 S 600 COUNTY LINE RD
HINSDALE ILL

CHARLES VALENTI
FORD MOTOR CO
216 15TH ST
BUFFALO NEW YORK

C VALENTINE
18 HEALTHS BRIDGE RD
CONCORD MASS

RANDOLPH M VALZ JR
MOBIL OIL CO INC
P O BOX 568
CHARLESTON 22 WEST VIRGINIA

H E VAN BEVERS
FISKE BROS REF CO
9105 ALDEN DR
LOS ANGELES 48 CAL

J C VAN GUNDY
TEXACO INC RES & TECH DEPT
ONE GATEWAY CENTER
PITTSBURGH 22 PA

D VAN DER BURCH
SHELL OIL CO
100 BUSH ST 8TH FLOOR
SAN FRANCISCO CAL

HANS U VON BORCKE
H U BORCKE ASSOC INC
39 BROADWAY
NEW YORK 6 N Y

K VAN DEN OUDEN
STEENKOLEN HANDELS VER
MR KESPERWEG 2
RIDDERKERK HOLLAND

CHESTER A VANDER PYL JR
FRAM CORPORATION
55 PAWTUCKET AV
PROVIDENCE 16 RHODE ISLAND

ROY P VANDERWALL
GARLOCK PACK CO
3237 MARTHA ST
HIGHLAND IND

J H VAN MEEUWEN
VAN MEEUWENS SMEEROL INDUST NV
POST BOX 7
WEESP NETHERLANDS HOLLAND

BANKS W VAN ORMER JR
SUN OIL CO
312 PROVIDENCE RD
MORTON PA

R W VAN SANT JR
GULF RES & DEV CO
P O BOX 2038
PITTSBURGH 30 PA

A F VAN SCHOICK
FISKE BROS REF CO
525 WESTMINSTER AV
ELIZABETH N J

G VAN TRUMP
J H KLINEFELTER INC
102 W SUSQUEHANNA AV
TOWSON 4 MARYLAND

LOUIS S VAN ZANDT
VANOCO INC
P O BOX 305
MIDDLETOWN N J

WM J VARETONI
CITIES SERVICE OILS
70 PINE ST
NEW YORK N Y

C H VAUGHAN
CITIES SERV OIL CO
20 N WACKER DR
CHICAGO 6 ILL

DALE VAWTER
VAWTER ENGRG & MACH CO
520 PALMER AV
AURORA ILL

ALBERT P VELTRE
MD SHIPBLDG DRYDOCK CO
2227 PLEASANT DR
BALTIMORE 28 MD

ERVIN J VESELY
METAL LUB CO
73 SHERIDAN RD
CLARENDON HILLS ILL

A J VETRANO
TEXACO INC
2222 HOAGLAND AV APT B 2
FORT WAYNE INDIANA

PAUL C VIENNA
AMERICAN OIL CO
136 WARREN ST
CALUMET CITY ILL

HENRY F VILLAUME
MINIATURE PRECISION BEARINGS
WINDY ROW
PETERBOROUGH NEW HAMPSHIRE

FRED J VILLFORTH JR
TEXACO INC
FISHKILL NEW YORK

J A VINCENT JR
STD OIL CO OF CAL
225 BUSH ST
SAN FRANCISCO CAL

GEORGE J C VINEALL
RAGOSINE OIL CO LTD
ROCOL HOUSE SWILLING NR LEEDS
YORKSHIRE ENGLAND

JINDRICH VINS
PRAHAX 12
HRADECKA 7 CZECHOSLOVAKIA

JOHN VOCELKA
WM W NUGENT & CO
7649 SUNSET DR
ELMWOOD PARK 35 ILL

HEINZ O VOIGHT
ARABIAN AMERICAN OIL CO
BOX 2252
DHAHRAN SAUDI ARABIA

E C VOLKERT
SHELL OIL CO
600 S JEF DAVIS PK PO BX 1290
NEW ORLEANS 10 LA

HAROLD J VOLLINK
NATL REF CO
7395 BUCKELL LAKE RD
HOLLY MICHIGAN

DR GEORGE H VON FUCHS
278 CONCORD AV
BELMONT 78 MASS

VANCE EMERY VORHEES
CRANE PACK CO
422 W MC DONALD RD
PROSPECT HEIGHTS ILL

L E VOSS
ST JOE PAPER CO
PORT ST JOE FLA

GEORGE B VUJAN
SUN OIL CO
102 WYNNECLIFFE DR
CARNEGIE PA

J S WACHOWICZ
SINCLAIR REF CO
5025 LAMB DR
OAK LAWN ILL

GERARD WACHTEL
CHESEBOROUGH PONDS INC
74 WOODLAND AV
GLEN RIDGE N J

DONALD A WACHTER
D A WACHTER INC
8860 LADUE RD
CLAYTON 24 MISSOURI

J N WADDELL
HENRY H CROSS CO
600 S MICHIGAN AV
CHICAGO 5 ILL

RONALD SIDNEY JOHN WADMAN
CANADIAN D A STUART OIL CO
206 GLENCAIRN AV
TORONTO 12 ONT CANADA

WILLIAM R WAGGOTT
CANADIAN OIL CO LTD
391 BURLINGTON ST
HAMILTON ONT CANADA

CHRIS WAGNER
CHRIS WAGNER CO
P O DRAWER 1317
HEMET CAL

H P WAGNER
WAGNER AGENCY
WOOSTER PIKE & N & W RR
MARIEMONT CINCINNATI 27 OHIO

WARD B WAHL
MOBIL OIL CO
8 IROQUOIS DRIVE
CLINTON CONN

H R WAITE
TECALEMIT CANADA LTD
REXDALE BLVD
REXDALE ONT CANADA

JOHN WAITE JR
INLAND STEEL CO
INDIANA HARBOR WKS
EAST CHICAGO IND

WALTER E WAITE
CITIES SERV OIL CO PA
165 BARCREST DRIVE
ROCHESTER 16 NEW YORK

AL E WALKER
LINCOLN ENGRG CO OF CAL
2844 S GRAND AV
LOS ANGELES 7 CAL

ALVIN B WALKER
OWENS ILLINOIS GLASS CO
1700 NORTH WESTWOOD AV
TOLEDO OHIO

DONALD G WALKER
888 W HILLSDALE BLVD
SAN MATEO CAL

GORDON WALKER
DOUGLAS AIRCR CO DEPT 9 270
3000 OCEAN PARK BLVD
SANTA MONICA CAL

PAUL E WALKER
ESSO STANDARD OIL CO
P O BOX 950
KNOXVILLE TENN

RICHARD B WALKER
SINCLAIR REF CO
P O BOX 388
NEWARK DEL

WARREN W WALKER
GRAPHITE METAL CORP
96 UNDERCLIFF ROAD
MONTCLAIR NEW JERSEY

ROBERT W WALLACE
GULF OIL CORP
5030 HILLCREST DRIVE
CLARENCE NEW YORK

OSCAR W WALLIN JR
RICHFIELD OIL CORP
384 KNIGHT WAY
LA CANADA CAL

JAMES I WALLOVER
WALLOVER OIL COMPANY
401 413 VIRGINIA AV
EAST LIVERPOOL OHIO

FRANK O WALSH JR
MANUFACTURERS REP
401 VOLUNTEER BUILDING
ATLANTA 3 GA

JOSEPH W WALSH
TEXACO INC
HAWTHORNE ROAD
JAMESTOWN RHODE ISLAND

LOUIS C WALSH
ALLEGHENY LUDLUM STEEL
30 NORTH CANAL ST
NATRONA PA

EDWIN W WALTER
SUN OIL CO
P O BOX 7438
PHILADELPHIA 1 PA

HOWARD A WALTERS
HULBURT OIL & GREASE CO
1242 RIDGE DRIVE
SO CHARLESTON WEST VIRGINIA

JULIAN G WALTERS
FORD MOTOR CO OF ST LOUIS
6250 NORTH LINDBERG
HAZELWOOD MISSOURI

THOMAS WALTERS JR
MESSINGER BEARINGS INC
D ST ABOVE ERIE AV
PHILADELPHIA PA

C D WALTHALL
PURE OIL CO
P O BOX 2607
CHARLOTTE N C

BEN WANDERMAN
PARAGON OIL CO
134 25 FRANCIS LEWIS BLVD
LAURELTON 13 N Y

DAMIEN J WARD
ALEMITE SALES CO
8015 MERRILL AV
CHICAGO 17 ILL

RONALD L WARD
USS ENGRG EXPER STA
110 AVONDALE CIRCLE
SEVERNA PARK MD

MILTON A WARDEN
WARDEN REFINING CO
1910 S 73RD ST
MILWAUKEE 19 WIS

A L WARDEN
WARDEN OIL CO
187 HUMBOLDT AV N
MINNEAPOLIS MINNESOTA

VIRGIL W WARE
ROHM & HAAS CO
WASHINGTO SQUARE
PHILADELPHIA 5 PA

WILLIAM W WARE
N H BALL BEARINGS INC
20 GROVE ST
PETERBOROUGH N H

LEMUEL O WARFIELD
AMERICAN OIL CO
170 WOODLAND DRIVE
PITTSBURGH 36 PA

ROBERT L WARING
AMERICAN VISCOSE CORP
FREDERICKSBURG VIRGINIA

ROY L WARING
CATO OIL & GREASE CO
1810 N E 9TH ST P O BOX 1984
OKLAHOMA CITY OKLA

CHAS L WARNECKE
CITIES SERV PETR CO
102 JEFFERSON AV
WESTFIELD N J

GEORGE ROSS WARNER
IMPERIAL OIL LTD
P O BOX 310
MONTREAL QUE CANADA

JOHN WARNER
CHARDON RUBBER CO
6TH & WASHINGTON STS
CHARDON OHIO

HENRY K WARTH
ESSO STANDARD OIL CO
1513 CHARMUTH ROAD
LUTHERVILLE TIMONIUM MARYLAND

ARTHUR R WASHBURN
AXELSON MFG CO
2118 WEST CRIS
ANAHEIM CAL

MARSHALL J WATERS
SHELL OIL CO PRODS APPL DEPT
50 W 50TH ST
NEW YORK 20 N Y

HUGH W WATSON
IMPERIAL OIL LTD
10 VERLAINE PLACE
SCARBOROUGH ONT CANADA

DAVID LAWSON WAY
ESSO STD DIV HUM OIL & REF CO
BOX 511
POTTSTOWN PA

RICHARD L WAY
SHELL OIL CO
1008 W 6TH
LOS ANGELES 54 CAL

ROBERT R WAYNE
NATL TUBE DIV U S STEEL CORP
327 CRAFT AV
PITTSBURGH 13 PA

JAMES A WEATHERSON
QUAKER STATE OIL & REF
419 KENNY ST
WHEELING W VA

JOHN F WEBER
E F HOUGHTON & CO
7566 MAYLAND RD
PHILADELPHIA 38 PA

WILLIAM L WEBER
QUA CON & GEAR LAB FORD MTR CO
P O BOX 331 CHASSIS PARTS DIV
DETROIT 32 MICH

HANS W WEBER
TENNANT PERU S A
COLMENA 611
LIMA PERU

JAMES A WEBER
CITIES SERV OIL CO
R D 1
COLUMBIANA OHIO

RICHARD K WEBER
UNION CARBIDE PLASTICS CO
511 WALNUT ST
MIDDLESEX NEW JERSEY

CHARLES LINSLEY WEBSTER
CENTRAL PETR CO
548 STANDARD BLDG
CLEVELAND 13 OHIO

PAUL T WEBSTER
CENTRAL PETR CO
548 STANDARD BLDG
CLEVELAND 13 OHIO

S F WEDEMEYER
ESSO STD DIV HUM OIL & REF CO
6309 BROWNING RD
MERCHANTVILLE N J

W P WEHKING
STANDARD OIL CO IND
6900 W MAIN APT 9
BELLEVILLE ILL

CHARLES A WEHRLY
AM STD IND DIV IND OFFICE BLDG
1060 BROAD ST
NEWARK N J

JOHN E WEIGEL
SHELL DEVELOPMENT CO
EMERYVILLE 8 CAL

ALLEN B WEINBERG
CITIES SERV OIL CO
4435 PALMA PLACE
SKOKIE ILL

GEOFFREY DYSON WEIR
TECALEMIT CAN LTD
27 FARR AV
THISTLETOWN P Q ONT CANADA

ROBERT A WEISE
SUN OIL CO
STATION F P O BOX 7
CINCINNATI 4 OHIO

MITCHELL H WEISMAN
8005 AIRLANE
LOS ANGELES 45 CAL

VICTOR A WEISS
ALLIS CHALMERS MFG CO
746 SOUTH 26TH ST
MILWAUKEE 4 WIS

CHALMER V WEISSERT
US STEEL GARY SHEET & TIN
1 BUCHANNAN ST
GARY IND

JOHN L WELCHER
SANTA FE SPRINGS MFG
8493 CARNATION DR
BUENA PARK CAL

GORDON BEECHER WELD
NOVA SCOTIA TECH COLLEGE
SPRING GARDEN ROAD
HALIFAX N S CANADA

WILLIAM L WELLS
REILLY WHITEMAN WALTON
339 STILL HILL RD
MT CARMEL CONN

C A WELTMAN
ALOX CORP
P O BOX 556
NIAGARA FALLS NEW YORK

PAUL W WENDT
GRAFO COLLOIDS CORP
431 S DEARBORN
CHICAGO 5 ILL

W M WENDT
GRAFO COLLOIDS CORP
535 CORNELIA AV APT 1204
CHICAGO 13 ILL

CHESTER L WENTWORTH
CONTINENTAL OIL CO
1755 GLENARM PLACE
DENVER 2 COLO

JOHN J WERNER
HUM OIL & REF CO OKLA PATE DIV
4533 WEST ROOSEVELT
CHICAGO 24 ILL

PAUL H WESSEL
PAUL H WESSEL CO
239 50TH ST
MOLINE ILLINOIS

CHARLES H WEST
TIMKEN ROLLER BEARING CO
1835 DUEBER S W
CANTON 6 OHIO

J P WETTACH
DRAVO CORP
DRAVO BLDG
PITTSBURGH 22 PA

C G WEYMILLER
PROCTOR & GAMBLE ENGRG
M A R BLDG
CINCINNATI 17 OHIO

WM D WHALEN
R K LE BLOND MACHINE TOOL CO
6760 PLACID PL
CINCINNATI 36 OHIO

ARTHUR H WHEATON
PRATT & WHITNEY AIRCRAFT
72 CHURCH ST
WETHERSFIELD 9 CONN

R C WHEELER
MOBIL OIL CO
612 S FLOWER ST
LOS ANGELES 54 CAL

JOSHUA C WHETZEL JR
ALLEGHENY REF CO
PLUM ST
VERONA PA

GUEAR M WHITESELL
EATON MFG CO FARVAL DIV
211 FRANKLIN ST
BEVERLEY NEW JERSEY

WM C WHITSON
R T WHITSON & SONS
2514 DIXIE HWY
SOUTH FT MITCHELL KY

A W WHITAKER
HUMBLE OIL & REF CO
2105 MISSOURI
BAYTOWN TEX

CLAUDE A WHITE
300 BONNER AV
LOUISVILLE 7 KY

DENZIL W WHITE
TELCO INC
4030 SUPERIOR AV
CLEVELAND 3 OHIO

HOBART S WHITE
NATL BUREAU OF STDS
ROUTE 3 BOX 131
GAITHERSBURG MD

JOSEPH H WHITE
CITIES SERV OIL CO
627 ROOSEVELT AV
PITTSBURGH 2 PA

RAYMOND RICHARD WHITE
ALUMINUM CO OF CANADA
ALCAN ARVIDA QUE CANADA

ROBERT N WHITE
SHELL OIL COMPANY
14717 RIVERSIDE DRIVE
HARVEY ILLINOIS

R W WHITE
HINDE & DAUCH PAPER CO
43 HANNA AV
TORONTO ONT CANADA

W S WHITE
JOHNSON WIRE WKS LTD
530 DE COURCELLE ST
MONTREAL 30 QUE CANADA

D E WHITEHEAD
CRUCIBLE STEEL CO
MIDLAND PA

EDWIN H WHITNEY
RICHFIELD OIL CORP
555 S FLOWER ST ROOM 819
LOS ANGELES 17 CAL

GEORGE C WHORF
CUNO ENGRG CO
MARIEMONT CENTER BLDG 27
CINCINNATI 27 OHIO

ARTHUR C WHYTE
IMPERIAL OIL LTD
2000 SHERBROOKE ST W
MONTREAL QUE CANADA

JOHN H WHYTE
THE BRITISH AMER OIL CO
1945 GRAHAM BLVD
TOWN OF MT ROYAL QUE CANADA

THEODORE B WIAN
S K F INDUSTRIES
BURLINGTON AV
HADDONFIELD N J

RAY W WICHMAN
HOTPOINT CO
4769 W ELECTRIC AV
MILWAUKEE WIS

JOHN R WICOFF
YOUNGSTOWN SHEET & TUBE
EAST CHICAGO IND

H W WIDENER
UNION OIL CO OF CALIF
330 DILLINGHAM BLDG
HONOLULU HAWAII

MURRAY E WIGHT
CANADIAN PETROFINA LTD
505 DORCHESTER ST W
MONTREAL QUE CANADA

C B WIGLEY
MONTGOMERY BROS
4800 DISTRICT BLVD
LOS ANGELES 58 CAL

DONALD W WILCOCK
ORD DEP DEF ELEC DV GEN ELE CO
100 PLASTICS AV
PITTSFIELD MASS

JAMES R WILCOX
BETH PAC COAST STEEL
360 MANCHA PL
MONTEREY PARK CAL

PHILIP T WILCZYNSKI
CITIES SERV OIL CO
1133 NORTH 46TH ST
MILWAUKEE 8 WIS

A B WILDER
E I DU PONT DE NEMOURS
P O BOX 1671 PETROLEUM LAB
WILMINGTON 99 DEL

JOHN E WILKEY
C H CLARK OIL CO
7555 BESSEMER AV
CLEVELAND 27 OHIO

CYRIL J WILLCOCK
B P S AFRICA PTY LTD
P O BOX 664
CAPE TOWN S AFRICA

JOHN K WILLCOX
AMER VISCOSE CORP
WALNUT & PINE STS
MARCUS HOOK PA

J W WILLEY
TEXACO INC
1033 QUARRIER ST
CHARLESTON WEST VIRGINIA

DEAN V WILLS
STD OIL DIV OF AM OIL CO
3715 HIAWATHA BLVD
FORT WAYNE INDIANA

PHILIP J WILLSON
CHRYSLER CORP ENGRG
12800 OAKLUND
DETROIT 3 MICH

FRANK J WILLIAMS
N AMER AVIATION INC
2017 SUMMERLAND ST
SAN PEDRO CAL

G C BUD WILLIAMS
PHILLIPS PETROLEUM
1512 S W 40TH
OKLAHOMA CITY, OKLAHOMA

GRANVILLE E WILLIAMS
N AMER AVIATION
1365 CALLE DURAZNO
THOUSAND OAKS CAL

JOHN B WILLIAMS
BAY PETROLEUM CORPORATION
P O BOX 18
HOUSTON 1 TEXAS

WM F WILLIAMS
WHEELING STEEL CORP
BOX 565 RD 1
MARTINS FERRY OHIO

C E WILLIAMSON
CANADIAN KODAK CO LTD
115 WINCOTT DRIVE
WESTON ONT CANADA

RICHARD G WILLING
MIC DIV FED MOG BOW BEAR INC
1201 NORTH ARDEN DR
EL MONTE CAL

EDW A WILLSON
GRAFO COLLOIDS CORP
P O BOX 195
SHARON PA

HENRY F J WILMOT
SHELL OIL CO
3600 ORANGUIE WAY
CARMICHAEL CAL

CHESTER E WILSON
UNION OIL CO OF CAL
824 W WATER ST
ANAHEIM CAL

DONALD H WILSON
CONTINENTAL STEEL CORP
SOUTH PLANT
KOKOMO INDIANA

HERBERT A WILSON
COMMERCIAL FILTERS CORP
30 COOLIDGE AV
LEXINGTON MASS

JACQUE L WILSON
INLAND GRAPHITE & CHEM CO
BOX 544
BRIDGEPORT CONN

JAMES L WILSON
TEXAS GAS TRANS CORP
416 W THIRD ST
OWENSBORO KY

LESLIE E WILSON
U S STEEL CORP
7403 BARING PKWY
HAMMOND IND

NORMAN A WILSON
MORGAN CONST CO
15 BELMONT ST
WORCESTER 5 MASS

ROBERT F WIMMER
LUB ENGRGS INC
2809 RACE ST
FT WORTH 11 TEXAS

ROBERT L WIMPERIS
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Status Report—

High Temperature Lubrication

Editor's Note—

STATUS REPORT—HIGH TEMPERATURE LUBRICATION is the third of a series of articles in various areas of general interest to lubrication engineers. Subjects have been selected on the basis of the reader preference survey conducted last fall.

In preparing these articles, your editorial board has been fortunate in securing the cooperation of nationally recognized authorities in various fields of lubrication research and engineering. Each article will comprise their comment in response to specific key questions on the subject under discussion.

J. Boyd

Work now being carried on in the investigation of high temperature lubrication would seem to have little or no relation to the immediate problems of an average lubrication engineer . . . about the same relation, in fact, as a new communications satellite has to the routine operation of a local telephone exchange. Yet, just as in the case of the satellite, general interest in high temperature lubrication is strong.

The explanation for this is quite simple. Now, as never before, serious minded men in every field of technology are vitally concerned with the future. And, in lubrication engineering, high temperature lubrication represents an important segment of the future. High temperature operating situations will become increasingly important and critical as time goes by.

Therefore, this status report on high temperature lubrication can actually be considered a look into the future of lubrication engineering. Mr. Johnson and Mr. Peterson are both excellently qualified as "seers", having devoted virtually their entire careers to lubrication research. Their concentration on high temperature problems for the past decade has resulted in many outstanding contributions to the literature and has won them nationwide recognition as authorities in the field.

commentary by

Robert L. Johnson
Head Lubrication Section
NASA—Lewis Research Center
Cleveland, Ohio

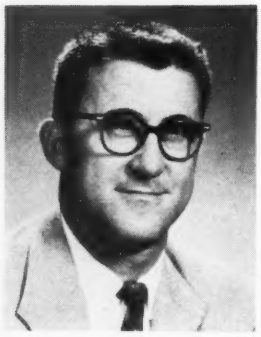
Mr. Johnson was graduated from Montana State College in 1942 and has been active in lubrication research ever since. In society work, he serves as chairman of the ASLE-ASME Lubrication Conference Committee.

Question: At about what level do special high temperature lubrication problems begin?

Answer: Approximately 700 F. Actually, problems begin to occur before operating temperatures reach 400 F, but techniques and lubricants to meet requirements in the 400 to 700 F range are fairly well defined. For instance, by means of a recirculating system with an ample reservoir and cooling provisions, lubricants can be used satisfactorily in locations that exceed their temperature stability range by as much at 200 F. The trick is to expose the lubricant to excessive heat for as short a time as possible, allowing for quick cooling between exposures.

Further, new materials are showing excellent characteristics in the 400 to 700 F range. Among these are the hydrogenated mineral oils and polyphenyl ethers. The former display ability to function for reasonable periods of time in closed systems at about 600 F and the latter go even higher under certain circumstances.

But above 700 F, every problem is special. From the 700 F level, current investigation and concern ranges all the way up to 3,000 F. In this area, conventional approaches and materials simply cannot function, even for brief periods of time, and a completely new technology is developing—high temperature lubrication.



Marshall B. Peterson
Friction and Wear Physicist
General Engineering Laboratory
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Schenectady, New York

After receiving his degree at Purdue in 1948, Mr. Peterson worked with the National Advisory Committee for Aeronautics until joining General Electric in 1955. He is past-chairman of the ASLE Fundamentals Committee.

Question: Why is such an extreme range of operating temperatures of general interest?

Answer: At first glance, aside from the lure of the future already mentioned, operation at temperatures above 700 F would seem to be of little concern to most practicing lubrication engineers. But on closer analysis, some very practical reasons emerge for the widespread general interest that *does* exist.

First, attention has been focused on high temperature lubrication by the fact that it has proved essential to progress on some of industry's most advanced projects—space exploration and nuclear power generation, for instance.

In space exploration, lubricants must be provided that will permit control operation under the extreme temperatures of burning rocket fuel or atmospheric friction during high velocity re-entry. In nuclear power generation, the operation of the system requires continuous exposure of certain components to ambient temperatures well above 1,000 F.

Second, common problems exist that have never been thought of as lubrication problems simply because lubrication above 700 F was never considered possible. Among these common problems, now being approached from a new lubrication viewpoint, are the rolling of hot metal, die casting die erosion and metal cutting tool wear.

In die casting, new means for lubricating the die hold promise as a way to reduce the die erosion that occurs as molten metal, about 1,200 F, is injected at high pressure. In metal cutting, new techniques based on providing high temperature boundary lubrication between tool and work can lead to increases in both tool life and cutting speed.

The third, and in the long run perhaps the most important, reason for general interest in high temperature lubrication is the growing realization that conventional lubrication techniques constitute a serious obstacle to basic improvement in many types of equipment. Provisions for cooling bearing areas and the stresses induced by temperature variations from part to part of a unit give rise to tremendous design problems.

If higher operating temperatures were permissible, these problems would be greatly decreased—and only effective high temperature lubrication can permit high operating temperatures. Further, higher operating temperatures are readily equated with higher operating efficiencies.

Thus, for three very good reasons—to permit progress on vital projects, to solve common problems and to eliminate critical design limitations—general interest in high temperature lubrication makes sense.

Question: What lubricants will function at temperatures above 700 F?

Answer: Liquids, gases and solids are all important in the solution of specific high temperature lubrication problems. But before discussing these materials, it must be pointed out that no quick, off-the-shelf high temperature lubricant capable of performing over a wide temperature range, in a practical variety of applications, is available or indicated by current research.

Instead, each problem must be approached individually and thoroughly analyzed to find a proper solution. In this light, here is a brief listing of some of the materials that have shown promise:

A. Liquids
   1. Lubricant fluids such as the hydrogenated mineral oils and polyphenyl ethers previously mentioned, or try-methylol propane, prove useful at the lower ranges if time of exposure to heat can be controlled.
   2. Liquid metals (molten state) are good in certain cases but must be used in an enclosed system to prevent oxidation. The liquid metals, although they are poor boundary lubricants, do have a wide fluid range and therefore are being considered for hydrodynamics or hydrostatic main shaft bearings.
   3. Reactive liquids that form surface films by reaction with or deposition on the wear surfaces have shown promise in some applications where temperature is consistent with the stability of the reactive liquid.

B. Gases
   1. At high pressures and temperatures inert gases and even air display good properties as hydrodynamic or hydrostatic lubricants. And the critical characteristics of most gases for this type of application improve as temperature increases.
   2. Reactive gases will function in much the same way as the reactive liquids to provide a low friction shear plane of a surface reaction product between adjacent surfaces.

C. Solids
   1. Certain organo-metallics such as phthalocyanine coat wear surfaces with a lubricating film that displays high temperature stability, but their action and effective range have not yet been well defined.
   2. Soft inorganic compounds, such as lead oxide or lead sulphide, or metals are actually made a constituent of the wearing surface of a part in some cases and provide self contained lubrication. The action here is well illustrated by the leaded, so-called "free-cutting" steels. The lubricating property of the soft metal ingredient is coming to be recognized as a primary factor in improved machinability.
   3. A great deal of work has been done with glass formers (ceramics) wherein lubrication is provided by a film of molten or near molten glass. These materials will operate at very high temperatures but only over a limited temperature range, depending on the specific material in use.
   4. Perhaps the greatest amount of attention to solid lubricants has been focused on graphite and MoS_2, using various systems of application and atmosphere control to achieve successful lubrication in a fairly wide range of applications. These solids have been used in gas or liquid stream carriers, as applied films and even as actual structural materials (seals and bearings).

Other materials and other techniques are under investigation, but the above listing includes the major avenues of approach. It must be re-emphasized, however, that high temperature lubrications is not achieved simply by applying one or another of these materials. Rather, each problem must be carefully studied to establish a successful *procedure,* if indeed one can be found at all. The lubricant itself is only one factor in such a procedure.

Question: How are high temperature lubrication problems approached?

Answer: A "systems" type of approach must almost invariably be used. At the elevated temperatures involved, all factors of environment, function, materials, time of operation and load will effect the

performance of a lubricant just as much as the lubricant will effect the performance of the mechanism.

The first step in attacking a high temperaure lubrication problem, therefore, is a highly precise definition of the problem itself. In addition to such commonplace data as type of bearing and bearing material, load, velocity and size, such unusual factors as temperature gradients across the parts, rate of radiation, atmosphere and local versus bulk temperatures must be determined.

Next comes consideration of the essential function to be performed and the exact temperature at which the unit is to operate, which brings the important factor of time into the problem. How long must the part and the lubricant or both be exposed to extreme heat, and over what range of temperature must operation be assured?

With these data at hand, plus careful analysis of which conditions may or may not be altered, the search for some means of providing lubrication to *make the device perform its intended function* over the desired range of temperatures can begin. This extremely practical approach, based simply on achieving minimum satisfactory performance, is necessitated by the high degree of complexity that attends almost all high temperature lubrication problems. All but the most essential functions of a lubricant must be set aside in favor of finding some means of assuring operation.

Only after desired function has been assured can attention be given to such secondary aspects of a lubrication system as corrosion resistance and reduced friction. Redesign of the mechanism itself is a last resort if no means of lubrication can be found that is compatible with the existing design.

In summary, the correct approach to any high temperature lubrication problem must be based on careful, precise analysis of each specific situation. Then, because difficulty is the rule rather than the exception, first consideration must be given to making the system work. Refinements come second.

Question: Are the materials used for high temperature lubrication readily available?

Answer: Yes, especially in the experimental quantities needed for the work now being done and even for the applications that now exist. Some materials, such as graphite and MoS_2, are available in any commercial quantity desired.

The really important question in connection with high temperature lubricants is not one of availability, though. Instead, *what* to use and *how* to use it are the basic questions. This latter problem entails all the alternative methods of application and really involves a total concept of the system to be lubricated.

Before leaving the subject of availability, however, a word of caution is necessary. High temperature lubricants are a lot like some of the more potent drugs in use today in the medical field. In the wrong application, some can be harmful and all should be used on the basis of "correct prescription only"!

Question: What are the key problems in achieving effective high temperature lubrication?

Answer: It is really unfair to select any one phase of the investigation of such a complex matter as high temperature lubrication and call it a key problem. It is absolutely essential that all factors involving any specific application at hand be considered.

However, within the concept of the "full system" approach, certain aspects of a system that are not critical at low temperature levels should be highlighted.

The first of these that takes on increased importance as temperature rises is the time of heat exposure. As mentioned before, if time of exposure is short and provision is made for cooling, some relatively conventional lubricating materials and methods can serve at temperatures well in excess of rated maximums.

Further, even where exposure to heat is prolonged, a "throw-away" system wherein lubricant supply is continuously renewed can, in effect, reduce the time of heat exposure. The lubricant used in such situations can be thought of as doing its job even as it breaks down under heat. Naturally, the accumulation of residues must be watched carefully.

Another time consideration is whether or not a given system must be capable of recycling. In some high temperature situations, lubrication need only provide for one period of operation. In other applications, even though the cycle of actual high temperature operation may be of short duration, recycling requirements make the periods of extreme heat exposure additive and the lubricant must remain effective for long periods of time.

This latter type of requirement, recycling, also raises the important question of temperature range. Some high temperature lubricants, the glass formers especially, are effective over only a rather narrow range of temperatures and are often inadequate when a unit is to be started, run to heat and then cooled periodically. In such cases, separate provisions for lubrication through various portions of the entire range of operating temperatures must be made.

In terms of conventional lubricating practices, testing to establish reliability is also unusually difficult in high temperature lubrication. At extreme temperatures, testing time may occupy too great a percentage of total life for practicability. Consider, for instance, the case of a "one-shot" mechanism. Testing would be, by definition, totally destructive and could not be used to prove that the system *would* work—only that it *did* work!

Still another unusually important consideration at high temperature is the determination of heat flow and thermal gradients. To combat the effect of heat, one must know exactly where the heat is and where it's going.

Once again, though, it is dangerous to attempt to isolate any special factors from the "full system" concept that must be used in attacking any high temperature lubrication problem. Time of exposure, temperature range, testing and thermal gradients are highlighted here only because they are increasingly important as operating temperature increases and

quite unusual in terms of conventional lubrication studies.

Question: Is there immediate application for the high temperature lubrication techniques that have already been developed?

Answer: Yes, all of the proven techniques known today have been developed to meet very specific needs. Moreover, all of the data and knowledge accumulated in developing these techniques will certainly have application far beyond the few high temperature systems now in operation.

Some of these possible applications have already been mentioned—hot metal rolling, die casting and metal cutting. Others undoubtedly exist, awaiting the necessarily detailed study that will result in profitable application of high temperature lubrication.

It must be remembered, though, that heat has been considered a traditional enemy in the design of virtually all equipment in use today. This axiomatic avoidance of high temperatures has been largely due to the lack of high temperature lubrication capabilities. And despite the fact that high temperature lubrication is being proved practical in many cases, it will probably be a long time before equipment designed for high temperature operation comes into widespread use.

Question: What effect will high temperature lubrication have on the practice of lubrication engineering?

Answer: As with all basic advances in the science of lubrication, the application of high temperature techniques will tend to upgrade the practice of lubrication engineering. The man in the field will be expected to know more, will be required to participate in a wider range of activities and will certainly be even more essential to overall operating efficiency than now.

Specifically, with the "full-system" concept of equipment analysis that will be basic in high temperature lubrication, the lubrication engineer will have to be familiar with a broader range of technologies. In addition to the general concern with bearing operation and maintenance prevalent now, the lubrication engineer of the future will have to consider loads, temperature-time integration, operating efficiencies and even environmental conditions.

There will also be a great deal more in-plant development work done, considering the highly specific nature of high temperature lubrication systems. Testing will have to be more precise and application more carefully controlled.

This latter automatically implies more sophisticated methods and systems for lubricant application as well as more careful training of workers on the lubrication staff.

All in all, the work of the lubrication engineer will be far more complex as high temperature lubrication becomes necessary and common. He will no longer be concerned only with the lubrication of existing equipment; rather, he will be an essential consultant in the design of new equipment.

Question: What is the "State of the Art" of high temperature lubrication?

Answer: Means for providing satisfactory lubrication for relatively long periods of time of operation at temperatures above 700 F and ranging all the way to 6,000 F are now under intensive study. Several approaches have been proved out as successful in specific applications and others that show great promise are in various stages of research and development.

Continued progress is certain because the requirements that have led to serious work in the high temperature area are critical. Thus, the door is open to the development of all sorts of equipment designed to take advantage of the body of knowledge and experience already accumulated.

Equipment designed for high temperature lubrication must necessarily precede the widespread application of high temperature lubrication methods. And with these methods still in the developmental and exploratory stages themselves, such a basic shift in design practices will not be sudden.

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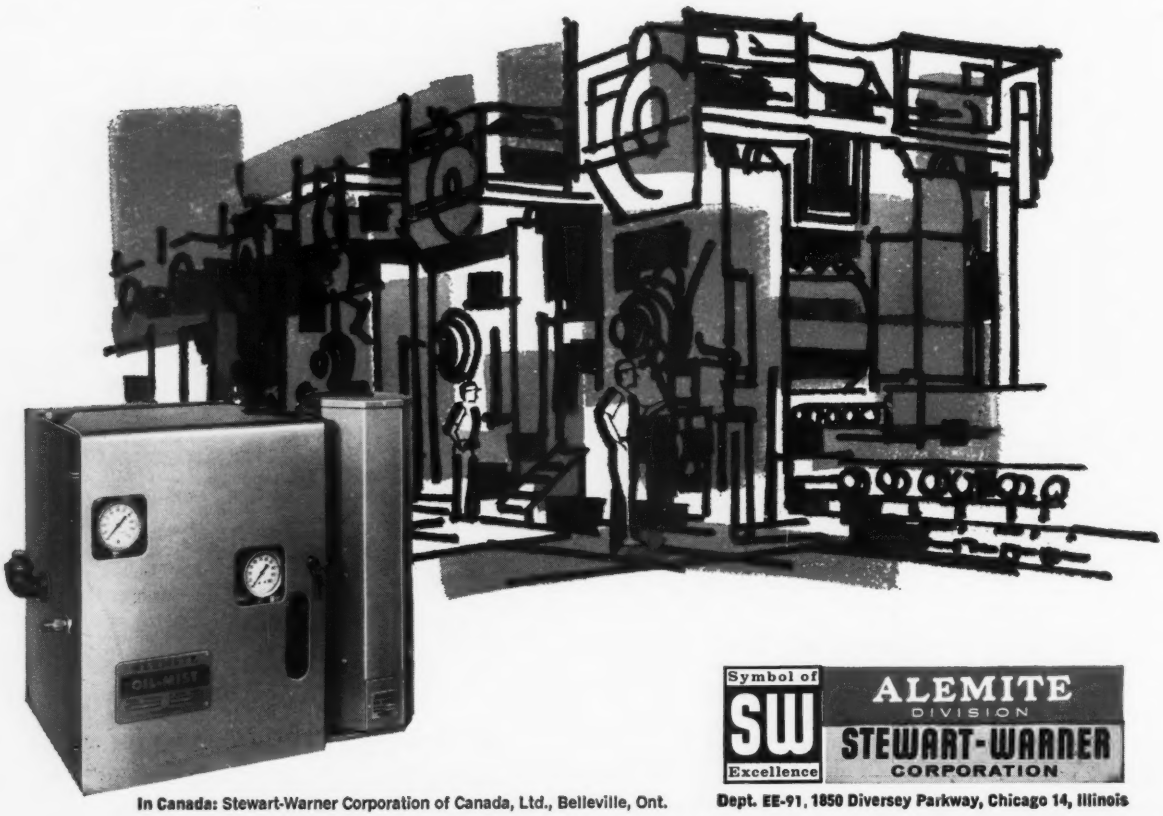

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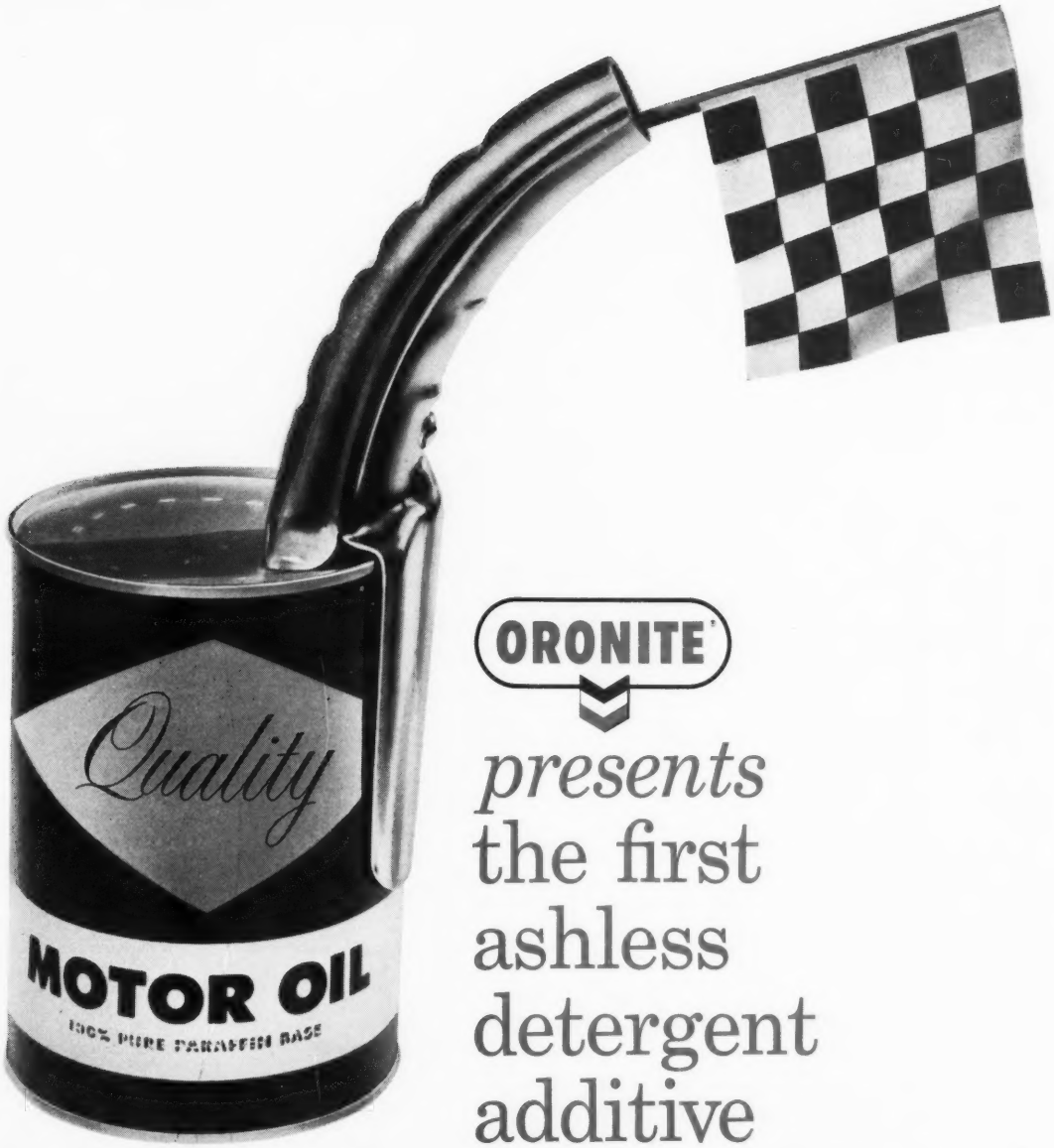

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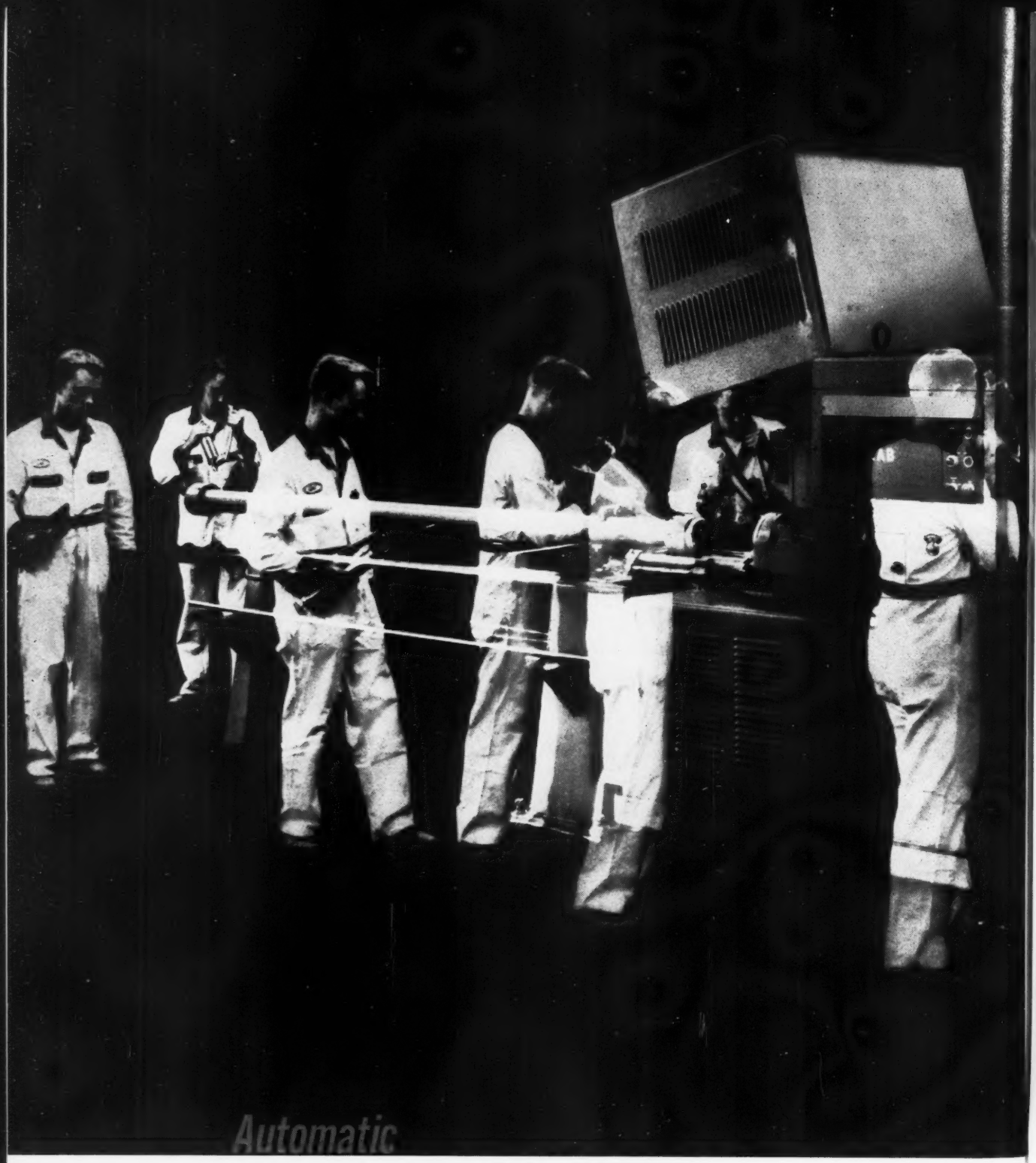

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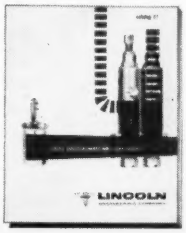

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Program for the 1961 Lubrication Conference

to be held in Chicago at the Morrison Hotel—October 17, 18, 19, 1961

Tuesday, October 17, 1961

SESSION I: AEROSPACE LUBRICATION

Ball Room—9:30 a.m.

Chairman: E. E. Bisson, NASA, Lewis Research Center, Cleveland, Ohio.
Vice-Chairman: M. B. Peterson, General Electric Co., Schenectady, N.Y.

"Bearing and Lubricant Requirements for Some Aero-Space Projects: Discussion and Preliminary Investigation," by R. H. Larson and A. G. Piken, Bendix Research Laboratories, Southfield, Mich. *(ASLE Paper No. 61LC-1)*

"Solid Lubrication of Metal Surfaces at Very High Sliding Speeds," by T. D. Witherly, Stanford Research Institute, Menlo Park, Calif. *(ASME Paper No. 61-LUB-16)*

"Friction, Wear, and Evaporation Rates of Various Materials in Vacuum to 10^{-7} mm Hg," by D. H. Buckley, M. Swikert and R. L. Johnson, NASA, Lewis Research Center, Cleveland, Ohio. *(ASLE Paper No. 61LC-2)*

"Friction and Wear Characteristics of Cermets at High Temperature and High Vacuum," by R. D. Brown, R. A. Burton and P. M. Ku, Southwest Research Institute, San Antonio, Texas. *(ASLE Paper No. 61LC-3)*

SESSION II: FRICTION, WEAR AND SURFACE FILMS

Ball Room—2:00 p.m.

Chairman: P. M. Ku, Southwest Research Institute, San Antonio, Texas.
Vice-Chairman: I-Ming Feng, Esso Research and Engineering Co., Linden, N.J.

"Friction and Surface Deformation During Sliding on a Single Crystal of Copper," by J. M. Bailey, Beloit College, Beloit, Mich., and A. T. Gwathmey, University of Virginia, Charlottesville, Va. *(ASLE Paper No. 61LC-4)*

"Chemical Changes in Steel Surfaces During Extreme Pressure Lubrication," by D. Godfrey, California Research Corp., Richmond, Calif. *(ASLE Paper No. 61LC-5)*

"Extreme Pressure Lubrication and Wear—The Chemical Reactivity and the Extreme Pressure Action of Two Aliphatic Disulfides," by A. Dorinson and V. E. Broman, Sinclair Research Laboratories, Harvey, Ill. *(ASLE Paper No. 61LC-6)*

"Polymer Formation on Sliding Metals in Air Saturated with Organic Vapors," by W. E. Campbell, Consultant, Cleveland 6, Ohio, and R. E. Lee, Jr., General Electric Co., Schenectady, N.Y. *(ASLE Paper No. 61LC-7)*

Wednesday, October 18, 1961

SESSION IIIA: PROPERTIES OF LUBRICANTS

Ball Room—9:00 a.m.

Chairman: L. B. Sargent, Aluminum Company of America, New Kensington, Pa.
Vice-Chairman: A. W. Lindert, American Oil Co., Whiting, Ind.

"Effect of Lubricant Viscosity on Metallic Contact and Friction in a Sliding System," by M. J. Furey and J. K. Appeldoorn, Esso Research and Engineering Co., Linden, N.J. *(ASLE Paper No. 61LC-8)*

"Heat of Preferential Adsorption of Surfactants on Porous Solids and its Relation to Wear of Sliding Steel Surfaces," by A. J. Groszek, British Petroleum Co., Ltd., Sunbury-On-Thames, Middlesex, England. *(ASLE Paper No. 61LC-9)*

"Preparation, Properties, and Some Applications of Super-Refined Mineral Oils," by E. E. Klaus, E. J. Tewksbury and M. R. Fenske, Pennsylvania State University, University Park, Pa. *(ASLE Paper No. 61LC-10)*

"Dynamic and Static Irradiation of Nuclear Power Plant Lubricants," by D. B. Cox, E. A. Oberright and R. J. Green, Socony-Mobil Oil Co., Paulsboro, N.J. *(ASLE Paper No. 61LC-11)*

SESSION IIIB: SPECIAL TOPICS

Venetian Room—9:00 a.m.

Chairman: E. Rabinowicz, Masachusetts Institute of Technology, Cambridge, Mass.
Vice-Chairman: C. M. Allen, Battelle Memorial Institute, Columbus, Ohio

"Viscous Lubrication in Wire Drawing," by J. F. Osterle and J. R. Dixon, Carnegie Institute of Technology, Pittsburgh, Pa. *(ASLE Paper No. 61LC-12)*

"A Study of High-Temperature Oscillating Plain Bearings," by W. A. Glaeser, Battelle Memorial Institute, Columbus, Ohio. *(ASME Paper No. 61-LUB-2)*

"Nonlinear Viscosity Effects in Slider Bearing Lubrication," by C. W. Ng and E. Saibel, Rensselaer Polytechnic Institute, Troy, N.Y. *(ASME Paper No. 61-LUB-7)*

"The Magnetohydrodynamic Slider Bearing," by W. T. Snyder, State University of New York, Oyster Bay, N.Y. *(ASME Paper No. 61-LUB-10)*

SESSION IVA: ROLLING CONTACT AND FATIGUE

Ball Room—2:00 p.m.

Chairman: E. G. Jackson, National Research Corp., Cambridge, Mass.
Vice-Chairman: H. E. Mahncke, SKF Industries, Inc., Philadelphia, Pa.

"Effects of Base Oil Viscosity and Type on Bearing Ball Fatigue," by F. G. Rounds, General Motors Corp., Warren, Mich. *(ASLE Paper No. 61LC-13)*

"The Effect of Contact Angle on Rolling Contact Fatigue and Bearing Load Capacity," by E. V. Zaretsky, W. J. Anderson and R. J. Parker, NASA, Lewis Research Center, Cleveland, Ohio. *(ASLE Paper No. 61LC-14)*

"Weibull Distribution of Rolling Contact Fatigue Life and Deviations Therefrom," by T. Tallian, SKF Industries, Inc., Philadelphia, Pa. *(ASLE Paper No. 61LC-15)*

"The Toroid Contact Roller Test as Applied to the Study of Bearing Materials," by W. J. Greenert, U.S. Naval Engineering Experiment Station, Annapolis, Md. *(ASME Paper No. 61-LUB-6)*

SESSION IVB: HYDRODYNAMIC LUBRICATION

Venetian Room—2:00 p.m.

Chairman: S. Abramovitz, Continental Bearing Research Corp., New York, N.Y.
Vice-Chairman: V. S. Wagner, DeLaval Steam Turbine Co., Trenton, N.J.

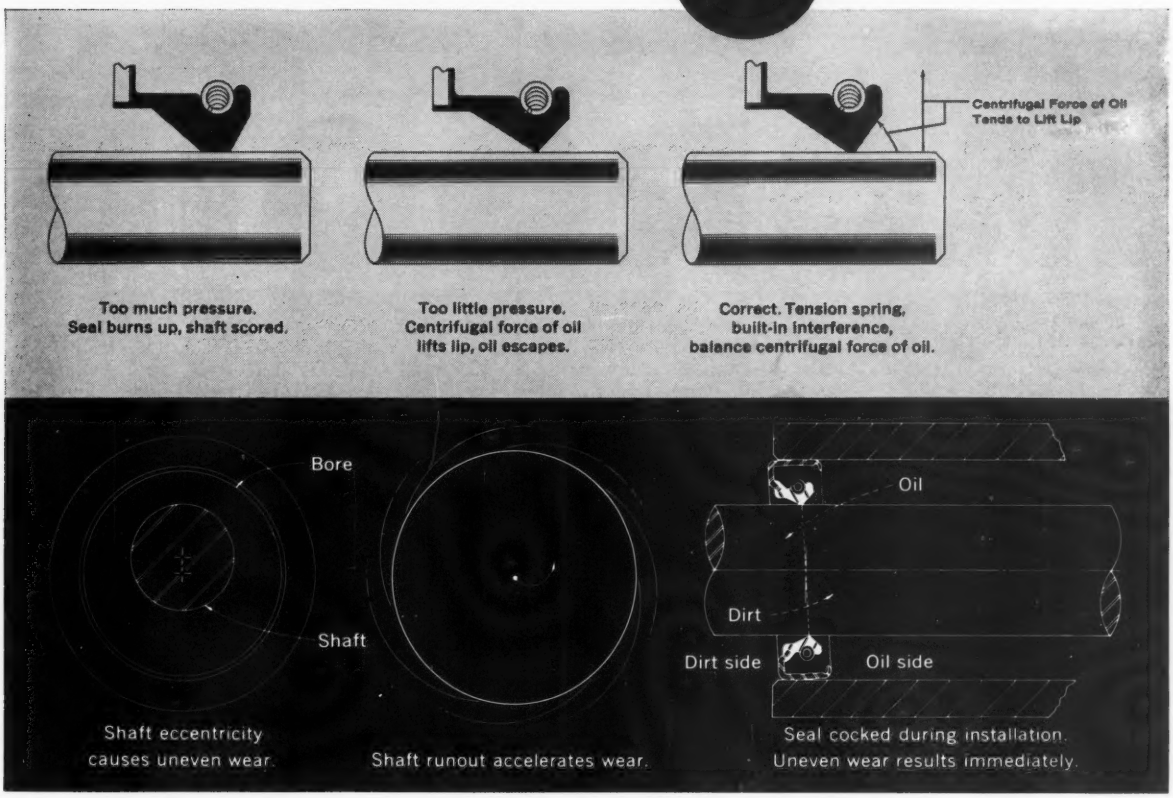
"Counterrotating Journal Bearings," by O. Pinkus, Technical Research Group, Syosset, N.Y. *(ASME Paper No. 61-LUB-9)*

"On the Optimization of the Stiffness of Externally Pressurized Bearings," by M. Ling, The Cincinnati Milling Machine Co., Cincinnati, Ohio. *(ASME Paper No. 61-LUB-3)*

"Experimental Investigation of Oil Film Behavior in Short Journal Bearings," by B. Auksmenn, Ingersoll-Rand Co., Phillipsburgh, N.J. *(ASME Paper No. 61-LUB-11)*

(Continued on page 463)

Lip pressure...too much or too little, and you've a leaker for sure!



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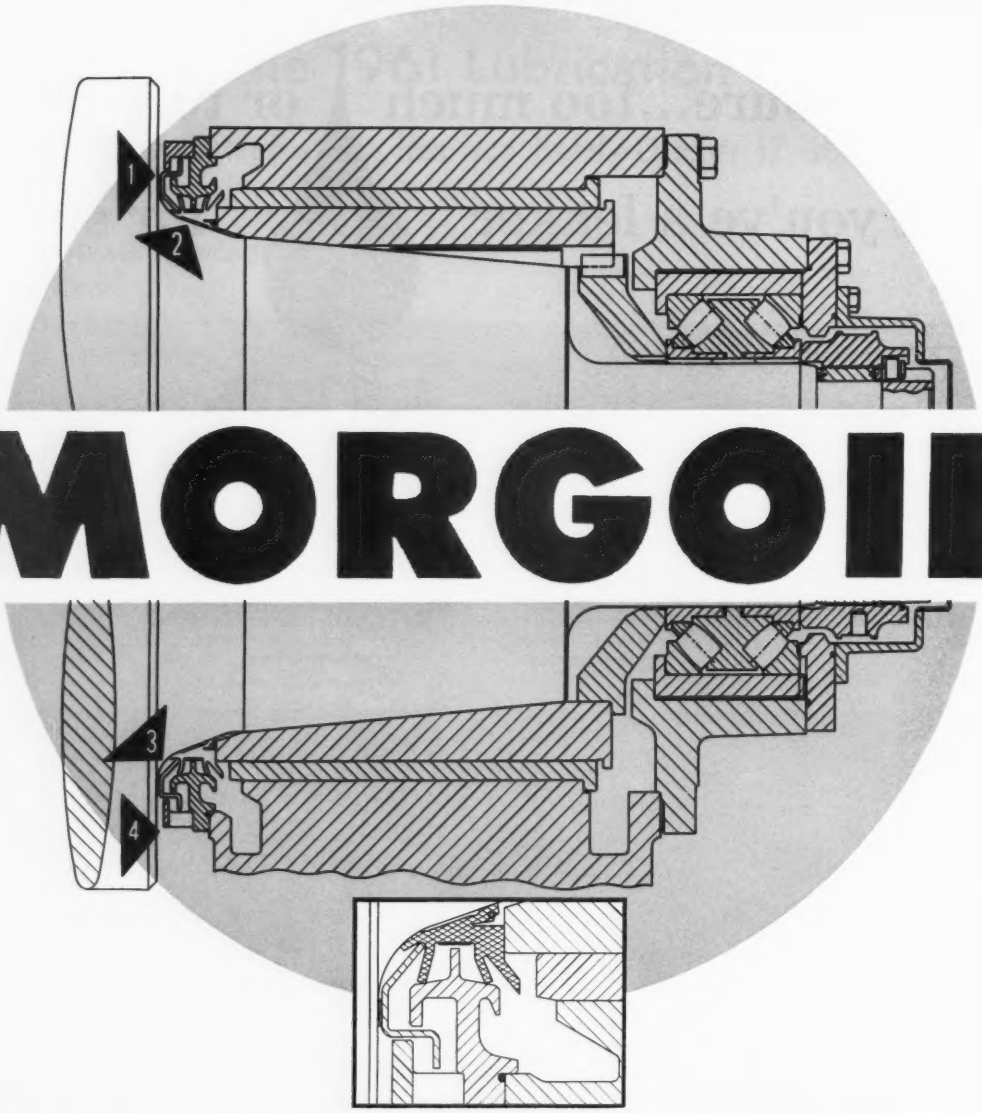

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Program for the

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(*Continued from page* 460)

"Theoretical Contributions to the Study of Gas-Lubricated Journal Bearings," by Y. Katto and N. Soda, National Aeronautical Laboratory, Tokyo, Japan. *(ASME Paper No. 61-LUB-8)*

Thursday, October 19, 1961

SESSION VA: ROLLING CONTACT BEARINGS

Ball Room—9:00 a.m.

Chairman: H. Hanau, Industrial Tectonics, Compton, Calif.
Vice-Chairman: H. E. Mahncke, SKF Industries, Inc., Philadelphia, Pa.

"Evaluation of Ball Bearing Performance in Liquid Hydrogen at DN Values to 1.6 Million," by H. W. Scibbe and W. J. Anderson, NASA, Lewis Research Center, Cleveland, Ohio *(ASLE Paper No. 61LC-16)*

"Development of a Ceramic Rolling Contact Bearing for High Temperature Use," by K. M. Taylor, The Carborundum Co., Niagara Falls, N.Y., L. B. Sibley, Battelle Memorial Institute, Columbus, Ohio, and J. C. Lawrence, SKF Industries, Inc., Philadelphia, Pa. *(ASME Paper No. 61-LUB-12)*

"Lubrication of Rolling Surfaces by a Ree-Eyring Fluid," by J. C. Bell, Battelle Memorial Institute, Columbus, Ohio. *(ASLE Paper No. 61LC-17)*

"Fluid Lubrication Theory of Roller Bearing, Pt. I: Fluid Lubrication Theory for Two Rotating Cylinders in Contact," by T. Sasaki, H. Mori and N. Okino, Kyoto University, Kyoto, Japan. *(ASME Paper No. 61-LUB-13)*

"Fluid Lubrication Theory of Roller Bearing, Pt. II: Fluid Lubrication Theory Applied to Roller Bearings," by T. Sasaki, H. Mori, and N. Okino, Kyoto University, Kyoto, Japan. *(ASME Paper No. 61-LUB-14)*

SESSION VB: TURBULENCE AND WHIRL IN BEARINGS

Venetian Room—9:00 a.m.

Chairman: A. C. Hagg, Westinghouse Research Laboratories, Pittsburgh, Pa.
Vice-Chairman: J. S. Ausman, Litton Systems Inc., Woodland Hills

"Analysis of Bearings Operating in Turbulent Regime," by V. N. Constantinescu, Institute of Applied Mechanics of the Rumanian Academy, Bucharest, Rumania. *(ASME Paper No. 61-LUB-5)*

"On the Translatory Whirl Motion of a Vertical Rotor in Plain Cylindrical Gas-Dynamic Journal Bearings," by C. H. T. Pan and B. Sternlicht, General Electric Co., Schenectady, N.Y. *(ASME Paper No. 61-LUB-4)*

"Investigation of Whirl in Externally Pressurized Air-Lubricated Journal Bearings," by W. A. Gross, IBM Research Laboratories, San Jose, Calif. *(ASME Paper No. 61-LUB-1)*

SESSION VI: EXTERNALLY PRESSURIZED GAS BEARINGS

Ball Room—1:30 p.m.

Chairman: J. H. Laub, NASA, Jet Propulsion Laboratory, Pasadena, Calif.
Vice-Chairman: J. S. Ausman, Litton System Inc., Woodland Hills

"Analytical and Experimental Study of Externally Pressurized Air Lubricated Journal Bearings," by J. R. Lemon, The Cincinnati Milling Machine Co., Cincinnati, Ohio. *(ASME Paper No. 61-LUB-15)*

"The Design of Externally Pressurized Gas Thrust Bearings for Maximum Stiffness and Stability," by D. C. Allais, IBM Research Laboratory, San Jose, Calif. *(ASLE Paper No. 61LC-18)*

"Pressure and Flow Studies of an Experimental Externally Pressurized Gas Lubricated Bearing," by G. B. Speen, ITT Federal Laboratories, San Fernando, Calif. *(ASLE Paper No. 61LC-19)*

"Analysis and Design of Externally Pressurized Gas Bearings," by I. Tang and W. A. Gross, IBM Research Laboratory, San Jose, Calif. *(ASLE Paper No. 61LC-20)*

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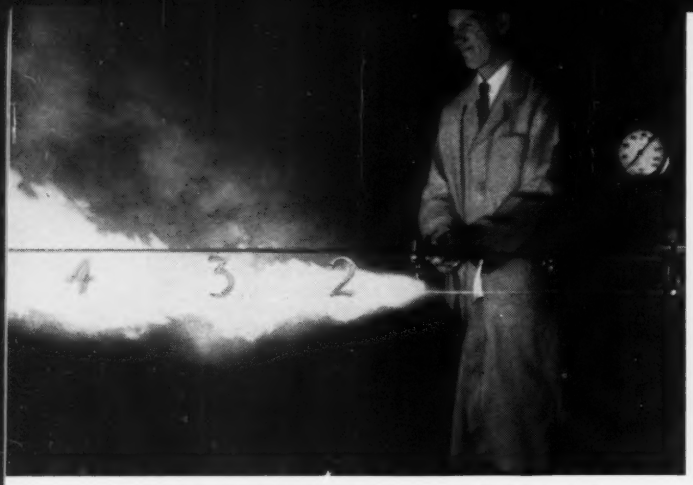

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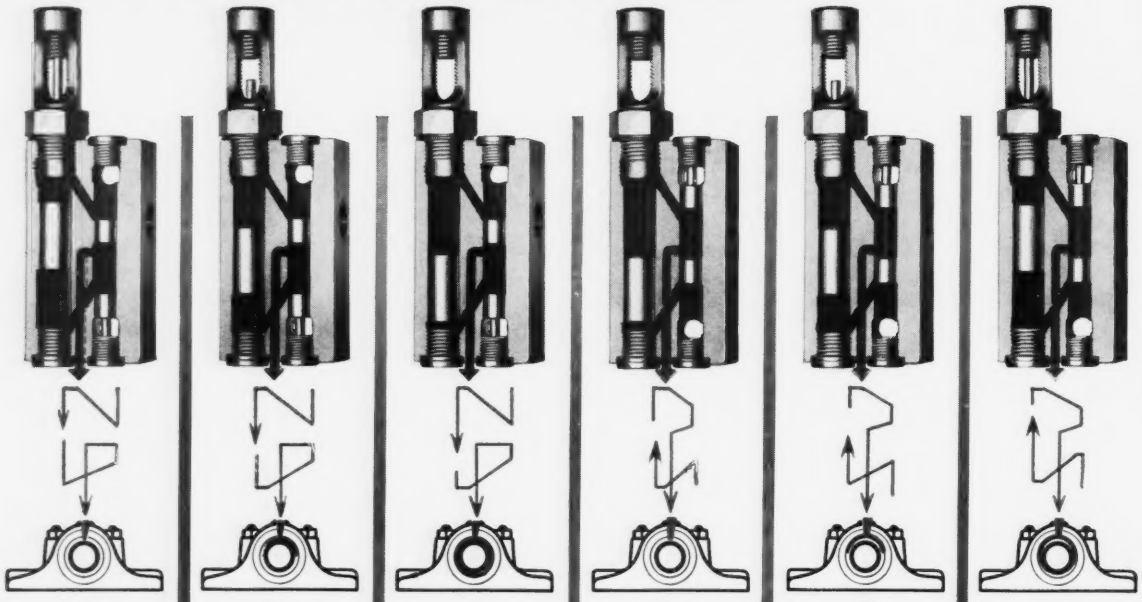

1

(In red) Lubricant under hydraulic pressure enters inlet at top right — pushing slide valve down and filling upper diagonal passage and chamber above main piston.

(In blue) By this movement, lower head of piston slide valve uncovers lower diagonal passage leading from the main piston chamber. This chamber is full of lubricant from the previous operation.

2

(In red) Lubricant under pressure entering through upper inlet port and into main chamber continues to force main piston downward —

(In blue) discharging lubricant through lower diagonal passage to vertical passage and to outlet port leading to bearing.

3

(In red) Lubricant entering from upper port has now forced the main piston to end of its stroke, and thus the full measured charge below piston has been delivered to the bearing.

Note that indicator stem has also moved down, indicating main piston has reached end of its stroke, and that no more lubricant will be delivered from this operation.

4

(In blue) Lubricant under hydraulic pressure enters inlet at bottom right — pushing slide valve up and filling lower diagonal passage and chamber below main piston.

(In red) By this movement, upper head of piston slide valve uncovers upper diagonal passage leading from the main piston chamber. This chamber is full of lubricant from the previous operation.

5

(In blue) Lubricant under pressure entering through lower inlet port and into main chamber continues to force main piston upward —

(In red) discharging lubricant through upper diagonal passage to vertical passage and to outlet port leading to the bearing.

6

(In blue) Lubricant continuing to enter under pressure from the lower port has now forced main piston to the end of its stroke, and thus the full measured charge above piston has been delivered to the bearing.

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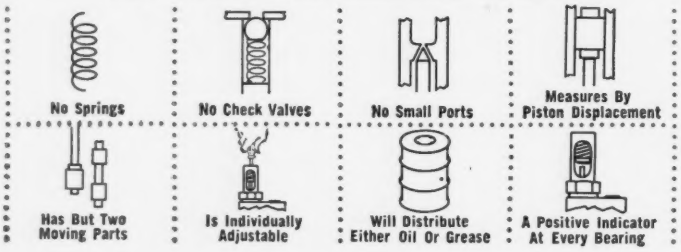
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